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PHILOSOPHY

WITHOUT ASSUMPTIONS.

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PHILOSOPHY WITHOUT ASSUMPTIONS.

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BY

THOMAS PENYNGTON KIRKMAN, M.A. F.R.S.

HON. MEM. LIT. AND PHIL. SOC. MANCHESTER
AND LIVERPOOL; DUTCH SOC. SCI. HAARLEM SOC. EXTR.;

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PREFACE.

As the remarks in the following pages on the teachers of our growing school of materialism are plain-spoken, I may lay myself a little open in the quarter on which their warriors, if they deign to reply, may charge, if I mistake not, with the greatest chance of applause from their admirers. Let me hope that this consideration will win pardon for a preface which discourses of myself.

I beg leave to state, not as a preacher, but as trying in vain with my feeble human ability to talk science where science is out of bounds, that I am a firm maintainer of the first of our XXXIX Articles. I say and I believe: Unus est vivus et verus Deus, æternus, incorporeus, impartibilis, impassibilis, immensæ potentiæ, sapientiæ et bonitatis, creator et conservatôr omnium, tum visibilium, tum invisi-

bilium. More precisely, I hold that this God in the beginning made all things, not *ex nihilo*, but out of nothing but Himself. I believe that He is at this moment exactly as at the first, if ever there was a first, making all things out of nothing but Himself; that He can, if He chooses, cease to make; and that, if He should for one second suspend His will to work, all things but Himself would for that second cease to be.

Further, as a scientific thinker, where thought is for ever repulsed, yet for ever attracted with more exalted joy, I believe in a Trinity in Unity; namely, I believe first in God the Unrevealed and Unrevealable; secondly, in God the Revealed; and thirdly, in God the Revealer. That is, I hold that, if my power of thought and knowledge could be expanded so as to set me far above the loftiest finite intelligence, and so that I could answer scientifically every question which I knew how to ask about this Cosmos, I should still be, all the same as now, affirming and adoring, with thankful and exulting strains, the Unrevealed and Unrevealable save to Himself, who is not only the Revealed, *πάντα καὶ ἐν πᾶσι*, but is infinitely more, infinitely in His perfection transcending all—

And hangs Creation, like a precious gem,
Though little, on the footstool of His throne.

This may be noted by those who think that a nickname is an argument, and who display their sagacity by crying, Pantheist. Secondly, I believe in God the Revealed, manifested outwardly to us and to other finite minds, in all this marvellous universe of force and life, of hourly mercies, and of counsels unfolded on the growing centuries, according to our faculties and attainments. Thirdly, I believe in God the Revealer, by whose indwelling and teaching only in this mind, heart, will and conscience, I know anything of Him or His ways, and am able to do His commandments. And these three are one and the same God. All this I state for myself, not imposing it on others, nor as a creed received from authority, but as my glorying inference, which I care not to call demonstration, from what I know.

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PHILOSOPHY WITHOUT ASSUMPTIONS.

CHAPTER I.

THE GENERAL QUESTION, AND THE STARTING-POINT OF PHILOSOPHY WITHOUT ASSUMPTIONS.

(1.) THE problem of Metaphysics has been propounded thus: What is? Many of those who have attempted its discussion have arduously employed themselves to answer the question: What must be? For the former enquiry I have a profound reverence; but I do not believe that its scientific discussion, as a direct and first question, is within the reach of my human powers. For the latter, as a problem either of men or of angels, I have a profound contempt. For me, the terms *necessary* and *necessity*, which accompany the unproved 'must be's' and 'can't be's' of philosophers, are the meanest and mouldiest of the rags with which Ignorance tries to hide her nakedness. In mathematics we have 'must follow's'

in plenty, but no 'must be's ; 'and when we say 'it is impossible,' we prove it to be so.

(2.) I remember the delight which I felt on first becoming the possessor of a Spinoza, from whose instructions about 'what is ?' I expected a wealth of knowledge. I turned first to his most famous treatise, the 'Ethics,' and I looked eagerly in his first page of definitions for his account of that most puzzling of all the tropes of philosophy, *Substance.* Never shall I forget the dismay with which I read Def. 3, 'Per substantiam intelligo id quod in se est et per se concipitur: hoc est id cujus conceptus non indiget conceptu alterius rei a quo formari debeat.' 'By substance I understand that which is in itself, and is conceived by itself; that is, the conception of which requires for its formation the conception of no other thing.'

I soon discovered that it is one thing to write metaphysics down in words, and to give directions for the formation of a conception ; and another thing to learn the science from the words and to form the conception. I tried my best to form the conception of substance *per se*; but I always caught myself endeavouring to form it also *per me* with the help of the definition, my own brains, and the troublesome idea of my puzzled self. I never could satisfy myself that I had the conception of substance formed

aright, because all my formations required the conception of some other things, myself being one.

(3.) The most charming and instructive book which I ever read on the question 'What is the absolute?' is 'The Institutes of Metaphysics' by Prof. J. F. Ferrier. He appears to me to demonstrate his way to his results, in a clear and sprightly manner, from his starting-point. Of the value of his result I am not metaphysician enough to give a correct estimate. It looks to me like a journey from Liverpool to Manchester round by Cork; but I am sceptic enough to criticise his starting point. His proposition (1) is the following: 'Along with whatever any intelligence knows, it must, as the ground or condition of its knowledge, have some cognisance of itself.' The observations appended begin thus: '"Self" or the "me" is the common centre, the continually known rallying-point, at which all our cognitions meet and agree.'

My feeling is, that this is not beginning at the beginning of Epistemology. By the use of the pronoun 'our' the writer seems to assume that he is in the presence of other thinkers. A thinker, one of many given, is the subject of the first proposition, and it is assumed that this thinker knows something besides himself, upon which he can ask and answer questions about conditions. Can we not try to make a be-

ginning of philosophy *without* assumptions? Ferrier does not begin like Spinoza, with the trope Substance, that wonderful tortoise which supports the elephant, and with propositions in his first page containing the Infinite, which is in my opinion a commencement unintelligible and quite at the wrong end; but he apparently begins with unproved assumptions.

(4.) The question which I propose to myself at the beginning of philosophy is this: *What do I find for myself without making unproved assumptions, and with demonstration that I can write down, so that another thinker, if there be another who understands me, can find it and demonstrate it for himself, without unproved assumptions?*

When I say to you, supposed given, ['I know a thing to be,' I mean that I find it, and that I can show you how to find it. I ought to state exactly what I mean by the words *assumption* and *demonstration.*]

[An *assumption* is the acceptance without proof of the truth of a proposition, of which truth proof may, without a flat contradiction or a glaring absurdity, be demanded.]

The determination to make and to grant no assumptions comes to the same thing as the Cartesian process of doubting of everything of which doubt in any way is possible. I think it a better way to the same thing, because it avoids the objection,—'You

are affecting to perform the impossible,' which has rendered the commencement of Des Cartes distasteful to many thinkers.

(5.) This rule of demanding proof, *whenever proof may without evident absurdity be required*, reduces my stock of propositions, at the start of my philosophy, to the fundamental one of Des Cartes, which I write thus : ' I am, and I know that I am, a conscious thinker.'

About the Cosmos, about my body or other bodies, or other thinkers, or anything existent with my thinking self, I at first know nothing ; that is, I will admit or grant nothing, until I know how to find and demonstrate it. If I have proof that you are there, with a fancy for hair-splitting between ' I am ' and ' I know that I am,' and for distinctions on paper of your own making, in Latin derivatives, between direct consciousness and reflex consciousness, whether yours or mine at this moment (which is all that I am considering when I say ' I am '), I shake my head and cannot go with you, because I should require to make this unproved assumption, that you do, although I do not, see a difference of meaning under that distinction in manufactured words.

I ought to state what I mean by *conscious* and *consciousness*. A *conscious thinker* is a thinker who knows that he is thinking, whether of the present or

the past, and *consciousness* in him is simply a name for the fact that he does know that. Let the tautology in 'I know that I am a conscious thinker' be pardoned: it means this only, 'I know that I am thinking.'

Let me beg the reader also to understand exactly what I here include under the word *thinking* or *thinker*. I include all that Des Cartes carefully comprised under his *cogitatio*, when he wrote 'cogitationis nomine intelligo illa omnia quæ nobis consciis in nobis fiunt, quatenus eorum in nobis conscientia est;' that is, I include every state or change of consciousness of which, at the moment, I may be aware, every sensation, every volition, every will-effort, of which I may be conscious; so that 'I am thinking'—includes 'I will' when will is in conscious act. I may be thinking that I see, that I hear, that I affirm or deny; thinking that I am endeavouring, that I have ceased to endeavour, that I am remembering, that I am trying to remember, that I have forgotten. But in all this affirmation of my thought, I make no assumption that there is in all the Cosmos any other being whatever, bodily or spiritual, out of my thinking self.

(6.) I shall often write 'I am' for the full proposition of Des Cartes in (5). But let me impress it upon the reader once for all, that it is never a meta-

physical proposition about 'being.' It means 'I am thinking:' it is the assertion of my conscious act of thought, at the beginning of my philosophy without assumptions, at this or any other moment. There are learned sophists enough who will try to throw a cloud on this starting-point by quibbles drawn from the etymology or the metaphysics of the verb 'to be.' If, when you affirm your 'I am,' any wise man should surprise you by the retort, 'Yes, but tell me what is being?' just beg him to write down his own ideas on the subject.

I would, according to my rule in (4), demand proof of my first proposition, 'I am a conscious thinker,' if I could do it without a contradiction. But how can I say, 'I am, and I know that I am, doubting that I am, and demanding proof that I am doubting'? It would be the raving of a lunatic, pretending to caper about himself in a circle without a radius.

(7.) I promised in (4) to state what I mean by a demonstration. A demonstration or a demonstrated truth is, *first*, the testimony of my present consciousness clear of all assumptions; or, *secondly*, it is truth constantly verifiable by me, the thinker, by facts in my consciousness, which I can repeat at my pleasure again and again without making any assumptions, or by logical inference from such facts;

or, *thirdly*, it is a deduction by logic from proved premisses. It is a mental act; not words.

I have heard objections to this definition of demonstrated truth. It is not here laid down as a formal definition, but rather as an account of what I mean. I value a demonstration not so much for its pedigree, as for its power and its speed to compel my assent when I am in the most sceptical attitude of thought. The objectors say that a proof which requires an appeal to experience, even of facts of consciousness, ought not to be called a demonstration, but that this title should be given only to proofs of science that are independent of experience, such as those of the theorems of number and geometry. I may affirm that I have demonstration that the ratio π of the circumference of a circle to its diameter is greater than 3·1415926535 and less than 3·1415926536, but not of the truth that I cannot walk through the solid wall before me, because the latter negative can be verified only by an experiment, and depends upon an *if*, namely, if the forces in action around me continue for another minute unchanged. For all that, I shall persist in calling my knowledge of the force in action in the wall demonstration, so long as I have the swift power to verify it by appeal to fact in consciousness at any moment I choose, until the experiment fails to yield the verification.

Nor do I see how I am to undertake to verify from the beginning the demonstration of the above value of π, without an *if*, namely, if I continue to have life and strength for the hard labour of a day or more. I can easily write down a variety of exact geometrical theorems, *e.g.* about the number and symmetry of the N-*edra*, each for one value of N, of which no man alive can think through the demonstration in a week. Nor can any theorem of rigorous science be demonstrated but by a repetition of facts of consciousness, which occupies time; so that in truth the *thirdly* above written is included in the *secondly*.

(8.) The 'cogito, ergo sum' of Des Cartes has been misunderstood. He tells us that, while it is wrong to say, 'I see or I walk, therefore I am,' it is right to say, 'I think I see, I think I walk, therefore I am.' He means that 'I am' can be deduced only from mental acts, as distinct from bodily. It is generally agreed that it was an error on his part to attempt to deduce it at all. The grand proof that my 'I am' is true, is the evident absurdity of my every pretence to doubt or deny it (6). However foolish my thoughts may be, I know that I am thinking. I may be thinking that I have squared the circle or that I shall wear a cardinal's hat; still I am quite certain that I am a thinker.

Mental acts are distinct from bodily. I am now

thinking that I am holding up my arm, and that I see it raised. About the mental will-effort that I am making I am under no mistake. It is an effort which, as I am led to believe, initially keeps up a certain charge of energy, through channels utterly unknown to me in their details, from my conscious will. I am also certain, from habitual experience and sure appeal to consciousness next moment, that I can continue or suspend that will-effort at pleasure, so long as pain does not compel me to cease. I am thinking not only that I see, but that I feel what I call my arm raised,—that is, I have certainly in consciousness the familiar muscular sensations which accompany that will-effort, and I have no doubt that those sensations will vanish from my consciousness when I, the thinker, choose to suspend the effort. But in all this I make no assumption that what I call my arm has any existence out of my mind, that it is more than my perception or idea of it, or anything with which, as a not-me-the-thinker, my will can come into conflict. That it can so come, is a proposition of which proof may, without contradiction, be demanded: and I demand it. I have not assumed, nor asserted, that it can, in affirming my thinking about it, all this being affirmation of mere facts of consciousness. I can find proof that it is more than

my perception of it; and I can show you how to find such proof for yourself.

(9.) I am making no assumption, nor taking anything for granted, when I affirm that I am, and know that I am, thinking. For, if I am really making an assumption, I can scientifically affirm that I am making it. But I cannot affirm this, without affirming scientifically that I am thinking either right or wrong: and if I am affirming scientifically that I think, I am not making any assumption under that affirmation. Nor can any man inform me that I am assuming my 'I am' without conceding and affirming my being and thinking.

Some small assaults on this 'I am' should be noticed. Great metaphysicians have tried to alarm me at this starting-point, by asking, How do you know that you are not at the moment dreaming, and how can you prove that you are not dreaming? I do not want either to know or to prove it. I know that I am thinking, and I affirm nothing more. It will be time enough for me to talk about dreaming, when I have demonstration of dreaming. Others have attacked me thus. 'All things are in a constant flux; therefore your "I am" is not the same truth two seconds together; it becomes "I was," and the Ego is thus always changing; wherefore "I am" cannot be a stable foundation of true philosophy.' I answer,

that the proposition that all things are in a constant flux, is one of which I demand proof, for I can demand it without evident absurdity (4, 5); and proof will not be easy. The simplest case of the constant flux is perhaps continuous linear motion, which in theory is possible at all finite velocities. Suppose now a ball rolling across a smooth horizontal table, at the finite continuous velocity of one inch in ten thousand years. How would that example of the flux, or your view of it, help your assault on my 'I am'? Are you quite sure that you can prove to me that all things in the Cosmos are not, even all finite conscious thought included, instead of being in constant flux, in constant alternation of flux and pause? The constant flux is an assumption unproved, which is outside my philosophy. Another remark often made is, that 'I am' contains an assumption, because self cannot be posited without a contrasted not-self. Of this negative proposition I demand a demonstration, a demand which is not absurd, because the remembered self of the preceding moment appears to be contrast enough for the self of the present moment.

(10.) I will not at this point undertake to give a scientific demonstration of what I am convinced is true, that I was in existence an hour ago; for I cannot prove that it is beyond the competence of a

power even less than infinite, to have called into existence five minutes ago a being like me, having all my present consciousness, convictions and memories, and writing his thoughts on this paper. But I will have nothing to do with philosophy that cannot be framed into clear propositions; and no debate is possible with or without antagonist, but on condition that my consciousness endures long enough for the making of a proposition. Therefore, dismissing all metaphysical quibbles, I write down this further definition of my 'I am' in (5) and (6): *I am, and I know that I am, the conscious thinker of a moment ago.* This is sufficient for me, and it amounts to this—*I am in time.*

It is futile and absurd for me, and perhaps for any finite thinker, to propound such a question as this—Is a conscious being possible in the nature of things who shall exist and affirm 'I am' for only a single moment, and then perish without the conviction, 'I was a moment ago'? Such a determined sceptic am I, that I would insist upon having demonstration, before I write it as certain, that I was a moment ago the same thinker I am now, if I could make my demand or express my doubt in a proposition without evident absurdity. But I am unable to frame such a proposition either in word or thought in one indivisible moment of time.

Wherefore it is nonsense for me or for an opponent to pretend to affirm that I am making an assumption, when I posit my present being and thinking in time. Henceforth my fundamental affirmation in (5) and (6) will be the same as this: *I am, and I know that I am, in time*, whether *in time* be added or not.

Whatever proposition of philosophy or science I may hereafter succeed in establishing must be deduced from this first and fundamental 'I am,' and out of it must all flow by valid demonstration (7) free from assumptions. For there is no other proposition besides this 'I am,' of which I may not without absurdity demand a proof, and, of which, before I can admit and register it as true, I am not compelled by my rule (4) to find proof without assumptions, such that I can write it down, so that you, any other thinker of whose presence I have obtained evidence, may find such proof for yourself.

(11.) This fixes for ever a *standing order* in my philosophy, which may be stated thus: [*In my every train of reasoned thought, the first proposition, out of which the entire demonstration flows, is, 'I am;'* and if every link of the argument is written down, this *'I am' must stand as the starting-point, at the head of all*, and does there stand in sound and complete logic, *whether written down or not*, in every train of reasoning thought.]

But this 'I am' (6) does not affirm nor include 'Thou art,' nor 'He is,' 'She is,' nor 'It is,' even though 'It' should mean my own body; much less does it include what nearly all our philosophers at first assume, as a matter of course, 'We are.' All these little propositions require to be proved before I grant them. I cannot go with those matter-and-must-be doctors who insist upon the necessity of assuming, at their starting-point of thought, themselves and their surroundings, themselves and their correlatives, themselves and their events, as they phrase it—who say this must be all assumed, and build on that must be the right to invent and define what best pleases them. Their first cry at setting out is, Here we are, and this is our boat; come with us and we will teach you philosophy; we will teach you evolution, and our much admired joke about evolving it all out of your consciousness. If I take their advice, I know well what will happen, when they get out to sea. If I contradict them, woe unto me! They will turn their unproved assumptions into the direst weapons of dogmatism and intolerance, and I may soon be food for fishes. I say to them, Gentlemen, I admire what little scepticism you have among you; my only fear is, that you dare not or will not carry it to the extent of mine. I am a reckless and incorrigible sceptic; but I would

rather not begin to play at that on board your boat. We will have a little, nay, we will have a good deal, if you please, of hardened scepticism here, just now, on *terra firma*, at the beginning, about your—'Here we are and this is our boat.'[1]

To me it appears that Liberty, Charity and Peace, as well as Truth, have as much to fear from the unproved philosophistic prophesyings now in vogue of 'Thus-saith Must-be,' as ever among Jews or Gentiles from the priestly tyrannv of 'Thus saith the Lord.'

[1] See Appendix I.

CHAPTER II.

THE FIRST DEFINITE QUESTION AT THE STARTING-POINT, 'I AM,' OF PHILOSOPHY WITHOUT ASSUMPTIONS.

(12.) THE preceding chapter is a long story about 'I am;' but its prolixity will be pardoned by those who know what metaphysical quibbling can do to muddle the clearest truths. I think that nothing is more helpful in the study of science than to have before one a well-defined question, for which a demonstrated answer has to be found, clear of all assumptions. But let us by all means avoid questions about abstract words, such as, What is X-ness? What is Y-ity? What is Z-ation? In studying the pages of a writer who employs such terms, we must needs ask, what does he mean by this? and we ought easily to find the answer from what precedes. But when an investigator or a teacher heads his chapter with On, or What is, Causation; On, or What is, the Absolute; On, or What is, Power; On, or What is, Cognition; On, or What is, the Super-

natural, &c.; and then shows the student how to dive into the abyss for a meaning, he is not the less unscientific because philosophers have filled thousands of pages with such researches. David Hume wrote a famous chapter on the Idea of Necessary Connexion, which contains not a word of explanation either of the adjective Necessary, or of the trope Connexion, which appear in the subjects and predicates of his dogmas; except that in one page the trope is made more intelligible by printing it CONNEXION; and he proves it at last to be absolutely without sense. Of all the marshallers of abstracts whom I know, Immanuel Kant is king. He goes out to sea with a wonderful display of bunting inscribed with generals and abstracts in *-ung* and *-niss*, and *-heit* and *-keit*; and then, after steaming away for 273 pages, it comes into his head that a little definition may be useful; whereupon he runs up more bunting, and gives us the pleasure—and this is all he gives—of reading under his leading German terms their Latin equivalents in *-tus* and *-tio*.

No man who undertakes to teach ought to employ an abstract term, much less an abstract trope, in which ambiguity is possible, until he has an exact meaning as well as a use for it, and is ready to impart that meaning to the student whom he has prepared to comprehend it, or else to show him how to

find the meaning for himself. Hence I fail to see the wisdom of Socrates in the 'Theætetus' of Plato, of which Prof. Ferrier in his 'Metaphysic' records his qualified admiration thus ('Introduction,' § 78): 'This banter throws Theætetus somewhat aback, upon which Socrates proceeds to explain himself. "You have rather missed," says he, "the point of my question. I did not ask you what *things* there is *knowledge of* —but what knowledge *itself* is." The explanation, although it lays the finger on the right point, does not mend matters much.' I confess that I think Theætetus here the better philosopher of the two. Ferrier considers this question of Socrates nevertheless a pregnant and promising one, for he proceeds thus in § 79: 'We must try therefore, what we can make of the question, What is knowledge? for ourselves. It constitutes, as has been said, the general problem of the first section of our science.'

If I had been in the place of Theætetus, with my present small supply of the philosophy of abstracts, I should have replied to the question of Socrates, *τί σοι δοκεῖ εἶναι ἐπιστήμη*; It is an abstract ending in *μη*, the use of which is to be defined as he sees fit by the teacher, if he will only stick to his definition. The question, 'What is knowledge?'—is more mystifying to a student than 'What is differentiation?'—because while he may truly answer, 'I know that I

am ignorant of differentiation,' he cannot reply, 'I know that I am ignorant of knowledge.'

(13.) The first question which I propose to myself at my starting-point is this : *Can I find, without assumption and with demonstration, any other thing or being, besides my thinking self?* It is important to observe that the word 'thing,' as well as 'being,' here stands for what I may come to find, not for what I cannot find.

My reasoning from 'I am' must needs first be a monologue, in which I have nothing given but the facts of my consciousness. With 'I am thinking' is given the whole of 'I remember,' and the sought demonstration must be built on 'I remember,' and on facts which I can at my pleasure summon into 'I am thinking.'

Memory, unless under cross-examination by present tests in my power, is not sufficient guarantee for a certainty of science; her clear records go for something, her blanks go for nothing. We have philosophers who, in writing about spontaneity, and automatic and reflex consciousness, can make science out of the blanks of memory, and who appear to be convinced that this did, and the other did not, happen, because they have forgotten all about it.

I have several times used the word 'power.' There is no need, for my purpose, of defining it to

'the student, who knows what he means by 'I can.' 'I have the power' means 'I can.' It is folly to attempt to make it more clear either by recital of the past, or by any display of present wisdom; for 'I can' is an affirmation of the future, and the event of the coming moment only can expound its meaning or its truth.

(14.) Let me classify, as well as I can, the facts of my consciousness. They appear to fall into three compartments. The *first compartment* is that of my remembered *listless indolence.* Do these words require definition? I think not, except to remark that I would not undertake to render by a word in another language our English *listless*, that is, wish-less and will-less.

I remember, and I can verify it again and again at pleasure, that I have often been in a state of delicious repose, not making the slightest effort of will to control or disturb the trains of reverie and passive sensation, nor to stir any of what I fancy to be my limbs or muscles, not a finger, not the axis of an eye; nor attempting anything like a mental proposition. This state is a mental reality independent of all theories about bodily being: its marked feature is the total inaction of my will, by which it is clearly known to me. In it I am the subject of fleeting fancies and impressions, which I neither

check, nor influence. Nothing is detained: the present becomes the past, without any attempt at comparison of what is going or gone. From what I can recall of such a state, nothing can be logically affirmed but my changing self. It is not necessary that I should dwell on the proof of this negative, which is, I confess, difficult of apprehension to one new to such enquiries, because nearly all philosophers of every school of modern thought are unanimous in their decision, that, from what I know of myself in that purely passive condition, nothing can be scientifically deduced by me about being of any kind distinct from my own. A very little reading will satisfy the learner of this. If the reader doubts it, let him ask himself what he recalls of what happened to his mental self in that state uncombined with assumptions and conclusions from other experience, which gives him certainty of more than mere sequences of changing consciousness. Touch with inquiring pressure is excluded, and other contact, where discomfort is away, conveys only perception of repose and temperature, mere conditions of contented consciousness. It is universally admitted, that sensations of sound and smell give by themselves no certain testimony to existence out of the sentient thinker. The familiar illusions of the mirror which still deceive us about what is, on

entering shops and saloons for the first time, are sufficient of themselves to deprive the witness of merely passive vision, unendorsed by active experience, of all scientific certitude. In these cases we only form erroneous judgments by the testimony of eyesight; but the truth is that, if it were really new to us, we should not form an inference of any kind concerning the being of a not-self. It is an established fact, from the repeated observation of the born blind who have received their sight by an operation, that their new optical sensations give them no distinct information whatever about distance, or space, or form, or solidity; they know not their own tools by sight, nor even their own limbs. Practice alone teaches them to translate the new language of light and shade into the mother-tongue spoken by grasp, testing touch, and bodily movement through distances.

It is thus abundantly clear that, in stepping from my starting-point 'I am,' without any assumption of my bodily being, or of an external world, into this first compartment of 'I remember,' I obtain no demonstration of finite being not myself.

If the student can attempt this step, without assumption of such being, he will see the truth of the preceding sentence.

(15.) The *second* compartment of 'I remember'

I call that of my *ill-recorded will-effort.* In this the will is remembered as active, but not in producing what I fancy to be movements of my body, such as leave any trace on memory; but only in comparisons and judgments of notions in my mind, of past and present, of new and old; or in the endeavour to solve some purely mental problem, or to recall some train of thought, some vanished record of memory. In this compartment there is no conscious relation to a not-me-the-thinker, nor any conflict but with pure difficulties of thought.

Because those difficulties occur and are overcome, at more or less mental cost, I call the found and remembered state *effort.* If I choose I can call it *force*; or if I like to reverse the letters *force*, and call it *ecrof*, I have a right to do so; for I can find the fact which I name, and I can show you, if you are there with a mind like my own, how to find it for yourself; and I can give what name I please in my philosophy to a definite fact and act of my consciousness. I call it *will*-effort or *will*-force, because I know by ten thousand experiences that it depends on my will. I can demonstrate, by summoning up that fact in consciousness, whenever and as often as I choose, that the condition necessary and sufficient for the beginning, continuance and ending of such effort, is my free choice and will. I call it my ill-recorded will-force,

because I find in memory no exact measures or comparisons of it.

I remember greater or less effort; but there is no given standard, nothing like scale or graduation. I cannot say, after the effort of recalling a Greek word or a mathematical formula, 'I will forget all that again and again, and make repeated comparisons of the efforts expended.'

Such exact comparison is impossible, where there is no relation of two contemporaneous terms before me. I will not undertake to find in this second compartment of 'I remember,' any more than in the first, the demonstration sought of finite being not my own.

(16.) David Hume, in his Essay 'On the Idea of Necessary Connexion,' which was written on purpose to muddle the plain truth 'I can,' grants all that I affirm in the very phrases in which he pretends to deny it. He says: 'We only feel the event, viz. the existence of an idea, consequent to the command of the will. But the manner in which the operation is performed, the power by which it is produced, is entirely beyond our comprehension.' This sentence is a fair sample of the mode in which this acute writer diverted himself at the expense of the saints and sages of his day. He allows that I feel, that is, that I am conscious of, this fact, that the existence of the idea is consequent to the command

of my will. That is all I say, except that I add for demonstration (7) that I can verify it by facts in consciousness which I can at my pleasure repeat again and again without assumptions. After confessing the command of the will (without any hint that *command* is only figurative) over the rise of ideas, he goes on to contradict himself, or rather to pop a word quite undefined into his reader's mouth, from which the confusion of contradiction may arise, the word *power*. 'The power,' says he, 'is beyond our comprehension.' All that we know is, that we do it by our will whenever we choose!

What a pity that Hume did not know Prof. Tyndall's word 'potency,' or the grander word, 'potentiality.'[1]

The use of such words, if Hume's good taste in English had allowed it, would have delightfully increased the confusion. With the words 'power,' 'energy,' and 'connexion,' he gravely plays his clever game all through the Essay, assuring the admiring beholders that the words have no meaning at all in any page but his own. And they do not require any definition there; for thus he writes: 'The necessary conclusion,'—*i.e.* from his philosophizing about connexion and power,— '*seems* to be, that we have no idea of connexion and power at all, and

[1] Vide Appendix on this section.

that these words are absolutely without a meaning when employed either in philosophical reasonings or in common life.'

What an evidence of Hume's scientific profundity is the title of this Essay!

But of Hume's tricks (no other word can well be used) the principal and most successful one is the triumphant presentation again and again of the undeniable truth, that none of us can tell him *how*; he says, as quoted above, 'the manner in which the operation is performed is entirely beyond our comprehension.' I grant all that. What do we mean by knowing or telling *how?* Shall I tell him that I call up ideas by the command of my will exactly as he does? Is that *how* enough? He shakes his head in silence. Well, then *how* must mean either *by which method*, out of a choice of methods, or, if there is only one method, by what exact steps in *time and place*. There is but one method, so that he demands, by what steps in time and place. But can he prove that there are successive steps in time and place in any act of consciousness, whether in passive sensation or active volition? Physiologists have made valuable discoveries about certain steps or sequences (with gulfs immeasurable of ignorance between) of nervous and muscular action, which are the antecedents of sensation and consequents of

volition; here they can say something about the *how*, at least a very little about the *how long*, of observed facts, on whose connexion by continuous process of change they can make dark guesses, as in the experiments of Helmholtz on the intervals between outward impression and the phenomenal answer of the will. As to the *how* of consciousness and will, the truth probably is, that it is a flagrant absurdity to put the question as one that can possibly be discussed by men or by angels, in the only terms intelligible to man distinct from consciousness and will themselves, *i.e.* in terms of time, space, and number. About the fact itself of consciousness or the act of will, our philosopher has just as wise a tale to tell as when he made his first hole in the atmosphere. His dissections of brains of dead men and living monkeys, and his wonderful parachute diagrams and ballooning demonstrations, how the wits 'they crept in and the' wits 'they crept out, and sported the eyes and the temples about,' are not a bit more life-science, because he dubs them Biology.

(17.) Before we examine our third compartment of 'I remember,' it may be of use for an assumed younger student to consider one or two things relating to the truth deducible from the first and second.

The present question is—What certainty have I, from my *purely passive* consciousness and experience,

of any existence besides myself and my cause? This is answered with remarkable unanimity by our great thinkers—No certainty whatever. To those who are not used to reflect on such subjects as this, it is very difficult to seize and retain the clue of thought. This is more than

> Untwisting all the chords that tie
> The hidden soul of harmony;

it is rather untwisting all the chords that tie the hidden harmony of soul and God, of life and Being. Let me attempt to make the task easier to the reader who is new to these enquiries.

Suppose a statue (no matter of what material) to be endued with perception and thought, like our own, save that it were incapable of all muscular movement, and without any experience of either the desire or the power of such movement. Let him hear all sounds with an immoveable ear; let him taste and smell, as acutely as you please, all that is wafted to his immoveable organs; let him see clearly all that is in the fixed focus of his immoveable eye; let him feel all temperatures and contacts at every point of his immoveable frame; and let the whole of his passive sentient experience be what he can learn from earth and heaven through the seasons under these circumstances. Suppose him

endued with memory, conscience and high reasoning powers; and let him have at his call communion with other spirits, exchanging thought by other than oral signs. Suppose him to have an ardent love of demonstrated knowledge, and the contempt of a thorough sceptic for feigned hypotheses, dogmatic authority, and signs without a meaning. If there be nothing impossible or absurd in such a supposition, nothing absurd can be fairly deduced from it.

Let us imagine our statue A in conversation with his spirit friend B.

A loquitur: 'I wish you would learn to avoid the use of terms without a clear signification. When you say the universe is divided into two parts, myself and not-myself, I agree with you, confining my attention to what is at this present moment. You are not myself; the cause of my being and yours is not myself. My perceiving and active self on the one part, and other perceiving and active selves on the other part, these exhaust the universe. I know also what you mean and what I mean by my existence in time. I am, I perceive and remember passively; I compare and think, and exchange thoughts with you actively; and I can predict, although I cannot demonstrate, much of the future from the past. But when you talk about space, and momentum, and motion, and distances, as you call them,

in space, you are employing terms—I wish you could see this—without a shadow of meaning that can be verified or reasoned about. What is a thing? We both understand what a person is, as well as the attributes of a person, and his relations to other persons. What is matter? What is motion? And, above all, what is this space, of which you pretend to discuss the imaginary relations? Is space of the past, of the present, or of the future? I know what number is, as applied to facts of past, present, and future, and to my own perceptions and to persons. It is a mere abstraction out of such application; yet there is nothing more delightful to my mind than the theory of numbers. I also know, and you know, what I mean when I say, I am hot, I am cold; I am dark, I am light; I am clear, or I am confused; I am gratified or disappointed; I am harmonious, or I am discordant; I am fragrant, or I am ill-smelling; I am bitter, or I am sweet. These are familiar perceptions. But what sense can there be in your distinction, that by some of these propositions I am correctly describing my varying perceptions, which arise, and change, and die, whether I will or no, while in others I am affirming qualities of certain unvarying things in your space, of which my perceptions are images or resemblances? Have you ever considered that a perception can resemble nothing

but a perception? my perceptions may be like yours, but it is utter nonsense to talk of them as having a likeness to what is not a perception, or as having properties and relations which do not flow from their property of being perceived. But I really have no demonstrative evidence that your perceptions are clear like mine, or you would not talk so confusedly about them.'

B.—'The truth is, that my perceptions are far more distinct than yours. I tell you that I perceive you as having place, form, and magnitude in space of three dimensions.'

A.—'Yes, I have heard you talk learnedly about your space of three dimensions. It is nothing but an imaginary interpretation that you give to the algebra of three independent variables. I know that algebra well enough, and I have expounded to you the algebra of four independent variables, which is just as lucid as that of three. Pray, what perception have you in space of four dimensions? If you have a set of ideas in three, why not a set in three hundred dimensions? There is an algebra for them all, and with a little ingenuity you may invent fanciful applications to things, as you call them, in all kinds of space. What is the use of talking to me about my form, my position, my material substance, and all the rest, employing heaps upon heaps

of words without a meaning? When you have framed definitions that we can both understand, or invented for my voluntary study an easy method whereby I can get a notion of your meaning, I shall think more highly of your wisdom. The cognizable universe, as the author of my being reveals it to my faculties, is the sum of my perceptions and memories, and of what my reason deduces from them. If these perceptions and memories be taken away from me and from minds like mine, what can possibly remain of the created universe? As to the word "force," of which you are so fond, if you mean by it the effort of will whereby I reflect and reason from my perceptions, there is some signification in it; but many terms that you employ without any clear relation to the past, the present, or the future, would be far better forgotten.'

Now let us suppose that A becomes endued with the power of moving the muscles of his eyes, and of adjusting the axis and focus of vision in directions all round, exactly as we do, without the power to shut his eyes, and without either the desire or the conception of any other voluntary movement or muscular action. After a certain period of meditation on his improved faculty of vision, his friend B asks about his progress in the study of space, matter, and motion.

A thus replies: 'I think I now see how you have deluded yourself into the belief of an outward world of things in what you call space, and I can conceive how you have made it in part correspond to the algebra of three variables. But I am more than ever convinced of the absurdity of your fancies, and, what is better, I can demonstrate to you your absurdity. A real space full of real fixed things, as you call them, independent of my conceptions! Why—I can modify it and change it at my pleasure. If this be your motion, this capricious variation of colour and shade, it is all motion, all stable or unstable, at my will, perpetual displacement or rotation, or whatever be the right term for the swiftly changing perceptions. Your credulity is wonderful, in believing that what you see is anything more than your changing self. But, in one word, I will demonstrate the matter. I can do what probably you cannot. I can make the whole perception single or double as I please. Now, if from my single perception I have a right to infer your real space full of things foreign to myself, then from my double perception I have as good a right to infer a double space and a double system of material, moving things. My double perception is just as much in my power and consciousness as my single one; the evidence of the double system is just as real and

producible at any moment as that of the single one. You are philosopher enough to see that this is flat demonstration of the absurdity of your imaginings. I am thankful to have the power to confirm actively, by the exercise of my will, what I had before deduced of the truth by my passive perception, and to be able thus to appeal to double demonstration, at any moment, on the subjects of your fanciful philosophy.'

It is not required for my purpose here to proceed with A's education in geometry and dynamics after receiving the power of movement. I am not responsible either for the mathematics or the philosophy of the collocutors, but only for the congruity between the amount of A's knowledge of space and force and his opportunities of learning, and for the soundness of his reasoning from what he knew.

I have sometimes said 'we.' Let this be pardoned as an unphilosophical assumption, for the purpose of passing illustration, not demonstration. I trust that the reader is too good a doubter to concede the *we* without good proof for it.

CHAPTER III.

THE SOLUTION OF THE FIRST QUESTION AT THE STARTING-POINT 'I AM.'

(18.) THE *third compartment* of my remembered consciousness I call that of my *related and well-recorded will-force.* If in this I cannot find a demonstration of being not my own, I shall have to be content, like other people, to begin my philosophy with assumptions.

I say that (5) in my 'I am,' 'I will' is given, that is, my will-force, when will is making effort. This affirmation rests on the appeal to consciousness, and it asserts nothing of an external cosmos of resisting forces. I showed, in speaking (15) of the second compartment of 'I remember,' that will-effort is a fact given in consciousness, and producible at my pleasure, a fact known as the condition of difficulty found and conquered, and of satisfaction often contrasted with strenuous disappointment, facts of consciousness as much as pleasure and pain. In naming this fact of effort 'will-force,' I make no

assumption of existing force external to myself; for the effort in that second compartment was not made, neither is it remembered, in any relation of resistance acting in the not-me-the-thinker, no not-self being posited or conceived in such will-effort. I say this to anticipate the cavil, which opponents will be forward to make against the argument which follows, that in affirming myself in effort I am assuming, and not demonstrating, a resisting force in the not-self.

(19.) That I am sometimes in repose, without will-effort of any kind, and sometimes in vigorous exercise of such effort, is a statement which memory records, and which I can verify by facts of consciousness, without any assumption concerning the cosmos and its forces outside the thinking me, though not of course without memory and repetition of my thinking (5, 8). The most important point for me to study is the exact point of transition out of one mental condition into the other.

I remember fancying myself in a state of listless and luxurious repose in my soft bed, so perfectly at rest that I could not, without a certain effort, give an exact account of the posture of what I call my limbs. I remember beginning to ponder this question, and, without the wish to attempt a movement, I have said to myself, It is quite certain that I can pass out

of this state into the consciousness of will-force exerted against resistance: and I have asked myself the question, What is the condition necessary and sufficient in consciousness for this transition? I have deliberately considered this again and again; for it is in moments of calm deliberation, not of sudden excitement, that science finds her truth. The only answer which I can frame to fit the facts of consciousness (and consciousness, as Hume observes in the Essay above quoted, never deceives) is this. I must first, in the freedom of my will, choose what fancied parts of what I fancy to be my body I will move, and when, and how, and whither I will move them, and then, by the energy of my will, I must issue the flash of volition, which alone can effect the movement. That is the lesson of consciousness to me, repeated times without number, without hesitation, without ambiguity, at this crucial point of transition from passive to active experience; and that lesson is worth a ship-load of their metaphysical or biological 'must-be's.' I am not about to enter here on the debate about free-will. My subject leads me thus far. I have to choose what to do, and then I have to do it.

(20.) I have not yet found the demonstration which I seek about found being, not myself. I examine the record of memory. I remember once

thinking that I moved my finger. I will try to do it again. Was that illusion? I am sure I made the will-effort. I think that I did move what I think to be my finger, and that I have power to move it again. Is that all a sequence of mere ideas, or is it more? I assume nothing. Is it right for me to say that *I can* bring about what I call the movement of my finger? Not at all right, cries David Hume. That 'I can' of yours, and that notion of your power, is a wonderful delusion. You have observed a sequence. You willed your finger to move, and it did move at the command of your will. A mere sequence: movement on the command of your will, nothing more. Power is a word without meaning. Thus Hume goes on wrangling, yet affirming just what I say, so far as it is a fact of the past. These are his words in the Essay above quoted (16):

'The motion of our body follows upon the command of our will. Of this we are every moment conscious: But the means by which this is effected, the energy by which the will performs so extraordinary an operation; of this we are so far from being immediately conscious, that it must for ever escape our most diligent enquiry.' To this harmless talk about knowing *how*, 'the means by which,' I have already (16) given sufficient answer. But Hume proceeds to say a vast deal more with his

must-be's, than he proves or attempts to prove by *must-follow*.

'But if by consciousness we perceived any power or energy in the will, we must know this power; we must know its connexion with the effect; we must know the secret union of soul and body, and the nature of both these substances, by which the one is able to operate, in so many instances, upon the other.'

It is difficult to believe that Hume, when he wrote this, was not setting traps for the parsons and philosophers of his day, and coining phrases with which shallower thinkers might fight each other. Did he see two different imports in these two propositions—I am conscious at every moment that the motion of my finger follows upon the command of my will:—and, I know that whenever I choose *I can* move and *have the power* to move my finger? How did he show, or how did he know, that all the *must-be's* which he writes above are really *must-follows*, on the *if* preceding? The answer to the question Can you?—Have you the power?—cannot be talk, but act. No verifiable proposition can be formed containing *power* or 'I can,' which can be completely tested for its meaning or its truth save by the fact of the coming moment. For the reason given in (13) the man who requires me to prove, or

really to explain, 'I can' by an exhibition of my present knowledge, may not be a blockhead, but he is a blunderer.

So then, 'I can,' I have the power to do it, is all an illusion, which has arisen from the iteration of a sequence of movement on desire. It is humbling; but it is beautifully simple. I think I remember, that I have often just cut through my cuticle in shaving; that I always desired it to heal, and that the healing invariably followed, that the bleeding ceased, and all was right in a very short time. How is it that it never entered into my pate that I had power to heal my wounded cuticle? There is reiterated sequence: why no inference or consciousness of power?

This *power* of mine, this 'I can,' which Hume pretends to prove a delusion, is a swift certainty of my soul, without which 'I ought' would be an absurdity. Its claim, its credentials, and its demonstration, are prophetic. It is the power of predicted action which is the glory of 'I can,' action which none but I can predict, prediction which none but I can fulfil.

Is it not possible for honest men to agree in what is proof that 'I can'? If it be what none else can do; if I engage to do it at so many times a minute, at intervals that I fix beforehand, and that

neither you nor your guardian angel can predict, and then again at intervals that you may beforehand prescribe; if I engage to do this, and do it, should not that be evidence that 'I can,' and that I know that 'I can'? Indeed, yes; but when we are simplifying the Cosmos, and reducing it all to number, time, space, matter, and must-be, 'I am,' 'I ought,' 'I can,' and 'I will,' must mean just what we please.

(21.) After all, this mere moving of my finger at the command of my will does look very like a sequence, though I know it to be more. I will not dispute this point with the mocking or mock philosophers who applaud the sophistry of Hume, and yet say I 'can' and believe it all day long just as I do.

I am still in quest of being not myself. I think I remember once moving all my fingers at once, or fancying that I did it. I think I am doing it now. It seems real and quite in my power. Yet it is certain that the desire to do it, and the idea of the apparent movement, do form one of the sequences of nature. But stop—how is this? I cannot do it now. The will-effort is clear enough, but there is bafflement. Do they call this a sequence?

What is this changed relation in which my will finds itself? The sensation of the freely moved

fingers, and the idea of the closed hand, will not appear in consciousness. I must dwell on this new combination. I cease my effort. The combination of will-force and bafflement disappears from consciousness. I renew the effort, I sustain it, I dwell upon it. Do they call this a sequence ?

I affirm that it is a *steady permanence in consciousness.* My state is at one moment *both active and passive.* The name sequence will not describe this fact, this new condition of me-the-thinker. I am sure that this is *a relation evident and abiding of my conscious will-force to a contemporaneous correlative.* Neither of these terms of the relation is before nor after the other. Together they begin, together they end; they begin and they end when I choose, purely at my pleasure. *I find more than one such permanent relation, as I am thinking I press what I call this arm, this wrist, this hand, these fingers,* with my hand, with comparable and measurable action and reaction.

From this found measurable and abiding relation, into which my will-force is brought in consciousness, contrasted with its usually free action upon what I call my hand; from every one of these evident and sustained relations, in which I find measurable gradation of more and less; and *from the nature of a real measurable relation, which must in logic have*

two congruous terms, I infer that the contemporaneous correlative to my acting will-force is *another acting force not my own.*

This relation, I say, I the thinker find in consciousness, and from it I infer another acting force; and what is more, from the logical law of a relation given above, I demonstrate it without assumption; that is, I have demonstrated an external world of force, and I can verify every step of the demonstration at any moment that I choose.

Thus my first question is answered: I am in the found presence of being and action not my own, in a cosmos of measurable forces. It is well for the reader to bear in mind the use of this demonstration of what to most minds may appear, from its self-evident truth, not worth the proving. It is intended to refute the teachers who maintain that no truth at all can be shown to follow from the mere facts of consciousness (vide 61); from which, if it were true, it would follow that it is impossible to have a philosophy without assumptions (11), and that we ought to leave the learned, who know so much about matter and law, to make the right ones for us all.

(22.) We are here very near to the climax of Hume's metaphysical farce in the Essay on the Idea of Necessary Connexion. In Part II. he writes (the reader is entreated not to smile at the word

'assurance'): 'How, indeed, can we be conscious of a power to move our limbs, when we have no such power; but only that to move certain animal spirits, which, though they produce at last the motion of our limbs, yet operate in such a manner as is wholly beyond our comprehension? We may therefore conclude from the whole, I hope without any temerity, though with assurance, that our idea of power is not copied from any sentiment or consciousness of power within ourselves, when we give rise to animal motion, or apply our limbs to their proper use and office. That their motion follows the command of the will is a matter of common experience, like other natural events: But the power and energy by which this is effected, is unknown and inconceivable.'

From this we seem to learn two things; one being that there is no 'consciousness of power within ourselves,' and the other that we are conscious of 'that to move certain animal spirits, which &c.' What does *that* mean in the first quoted sentence? Plainly that power! We are conscious of that power, and also of no power! Hume opined 'with assurance' that few of his contemporaries would see the twinkle in the eye of *that*. The man who knows that 'power' is 'absolutely without any meaning when employed either in philosophical reasonings on common life' (16), knows that we are conscious of

that power! 'We have no idea of power' (16), but we are conscious of *that* power, and 'consciousness,' says he in Part I., 'never deceives.' If the reader can persuade himself that Hume in the above quotation is not denying, but conceding, that 'we have a consciousness of power within ourselves,' he will still have plenty of contradiction to reconcile.

The best, the climax, is to come. At the last word quoted, 'inconceivable,' is an asterisk guiding to the note following in small type: 'It may be pretended that the resistance which we meet in bodies, obliging us frequently to exert our force, and call up all our power, this gives us the idea of force and power. 'Tis this *nisus* or strong endeavour of which we are conscious, that is the original impression from which this idea is copied. But, *first*, we attribute power to a vast number of objects, where we can never suppose this resistance or exertion of force to take place; to the Supreme Being, who never meets with any resistance; to the mind in its command over its ideas, and limbs, in common thinking and motion, where the effect follows immediately upon the will, without any exertion or summoning up of force; to inanimate matter, which is not capable of this sentiment. *Secondly*, this sentiment of an endeavour to overcome resistance has no known connexion with any event; what follows it we know by experience,

but could not know it *à priori*. It must, however, be confessed, that the animal *nisus*, which we experience, though it can afford no accurate precise idea of power, enters very much into that vulgar, inaccurate idea, which is formed of it.'

The expression, such as it is, at the two ends of this note, of the truth excluded from the Essay, is very like the correct renderings which we frequently find placed in the margins of our Bibles, because it was not convenient to put them into the text. After refining about the sequences of natural events and common experience, without one reference in the essay to resistance found, much less to resistance maintained and dwelt upon, he pitches the two real terms of that solving relation which we have handled, the *nisus* or will-force and the found resistance, with affected disdain, to be lost or picked up in the labyrinth of that unanswerable note! I hope to be forgiven if I leave to more ambitious critics the glory of disentangling its wisdom. If in debating the question, Has a man any real meaning for his words when he says, I can, and I know that I can, move this or that with my hand?—the aim of the writer is to mystify the student, and to mislead him from the point of view which commands the topic into an infidel belief in blind unmoral must-

be, he will be wise to imitate the tactics, the capitals, and the small type of David Hume.

After Hume's masterly example, it cannot be very difficult for an aspirant to philosophical glory, to write 'On the Idea of X-ary Quocumlibetation and Potentiality,' demanding from the astonished world their scientific genesis of these important conceptions, and finishing with a demonstration that neither the muddling writer nor muddled mankind ever had any ideas at all on the subject: (16).

I hope that the space which I have devoted to Hume's famous Essay will not be thought injudicious or valueless. Great as the mischief is which his writings have done, the good effected will far outweigh it, when his splendid lessons of acute and sceptical thought have been sufficiently mastered to enable thinkers to doubt his philosophical wisdom and to expose his sophisms. As the smoke of his well-directed ordnance dies away, the truth will shine at last all the more gloriously for the clearance of rubbish which he effected by his gunnery.

It would have been to the learned reader more formally correct, if I had concluded my own argument, before criticising Hume; but I cannot help believing that the learner will find in my handling

of the enquiry both a livelier interest and a clearer insight, by comparison of points of view.

(23.) The reasoning on the solving relation in (21) is the same, whether the resistance encountered by our will-force arises from our own bodies, or from any others in the world around us. Pain taught us very early to distinguish our frames from other loci of force. I believe that all my conceptions of an external world are derived from contact and conflict with it, exactly like the conceptions of a man born blind; and that the telegrams of light are intelligible to us who were born with perfect eyes, only because we learnt by gradual practice from the beginning to translate them into the ideas and practical memories of the blind. The great Berkeley made a splendid step in original discovery when he first pointed out in his Theory of Vision the nature of the information which our eyes really supply to us by themselves.

There is no room for the question which a hasty scepticism might raise on the argument in (21), How do you know that the resistance, which you infer from the relation found in consciousness, is not purely ideal and imaginary? The reply is easy from the law of a real relation, which is, that *both its terms are real or both unreal.* The case of both unreal may be left out of consideration, although it

is familiar to the learned, where the relation is still real. Everyone can understand that there can be no real measurable relation between a real term and an imaginary term, because there can be nothing real in which comparison is possible, nor any real scale of measurement. Now in (21), one term of the found relation, my will-force, I know to be real, as real as my own 'I am,' and I know also that it is in a real measurable relation, because I find and measure it from less to more effort; therefore the other, the inferred term, is real, and not unreal; it is as real and as far from imaginary as my thinking self. That is, I have demonstrated the existence of a world around me of real, acting, measurable, forces.

(24.) I call my related will-force (18) well-recorded, because it is well-measured, well-graduated, both in memory of experiments repeated again and again at pleasure, and in trained and accurate consciousness of present power. At first my will-force was a measurer, my only measurer of force around me. I soon learnt in infancy from 'I am,' and 'I will,' what was easy, and what was beyond my utmost effort.

In time a unit of force was fixed: gravitation supplied the most convenient one, in some obstacle which I chose to call a pound weight, by which other obstacles were compared in terms and

memories of will. In time I learnt the use of the balance and the pulley, and had thus a way of measuring my utmost effort; and my will-force became both measurer and measured. Friction or elasticity might have supplied the unit, but less conveniently.

The most important thing to be observed is, that it follows from that genesis of my notion of external acting force which has been expounded, that all my clear conceptions of force are either memories or imagined multiples of will-force expended: memories, when the number of units in my measure does not surpass my utmost power, as two or three hundredweight; and multiples, when I am talking of tons.

I am inclined to think, but I do not press this, nor undertake to demonstrate it, that all my notions of distance and volume, nay all my notions of shape, are either memories or multiples of expended will-force. They certainly are not due to the teaching of my eyes; for the notions of a man born blind on distance, volume, and form, are as accurate as my own; and I believe that I obtained them just as he did, by memory and mental multiplication of effort in the movement with expended force of my fingers, my limbs, or my whole body through space. I learnt distances, when I crawled in the nursery, not by seeing them—I do not believe they can be

seen—but by working them through, sometimes in easy effort and more time, sometimes in full strain and shorter time; and thus by my own movements I learnt the conceptions of space which I now include in the symbolic formula $s=fT$, or space is the product of so many units of acting force and of a function of the time t through which it acts. And now, when I talk of the distance between me and Sirius, or of the force which is hurling me through space myriads of miles in an hour, I am affirming, though I am not clearly conceiving, the equivalent to a vast measurable multiple of my own expended will-force.

CHAPTER IV.

FUNDAMENTAL PROPOSITIONS IN ALL REASONING ABOUT FORCE.

(25.) I CANNOT see how the reasoning of (21) is to be denied, except by a denial either that the solving relation of which I spoke can have place, or that I can find this relation. Such denial, when stated logically, can, I think, only amount to a denial that what I call my will-force, my will in act, can have a proper relation to outward physical force. To deny that I am, or that I find myself, *in relation*, is to affirm that I am *out of relation*, that is, that I am what they call the absolute; which is plainly absurd. To a denial of a fact of consciousness, such as this relation of my will in act, which I say I know and find, there is no reply beyond an appeal to consciousness, which every thinker must make for himself. If anyone pretends that it is absurd to affirm a real measurable relation between my will-force and outward physical force, I can refer to the test of experience for my voucher. Supposing that you

are here, a being like myself, with a balance and weights, I beg you to put two pounds in one scale, and nothing in the other. The empty scale is in the air : I put my finger in it, and there is equilibrium. I can predict how long it shall last ; I can predict which scale shall rise, and which shall fall, and by my will fulfil my predictions, maintaining the postures of the scales as long as I please. Is it then absurd to speak of measurable relation between my will-force and gravitation ?

It is very good in you to inform me, that the force acting through my finger is one of the physical forces which Biologists and Physiologists quite understand, from their knowledge of the vital properties of protoplasm. Let them come here with their scientific knowledge, and predict for half a minute the behaviour of this force, under any conditions they may choose as most convenient for the display of their wisdom.

Put two pounds in each scale; there is equilibrium. I take one pound out of one scale, and put my finger there instead of it. There is still equilibrium. When my will-force can thus take the place of your unit of pounds, and do its work, combining with the unit in the scale to produce the same relation of equality, as the two units produced together, will you still deny such measurable

relation between my will-force and physical force?

(26.) A stone is in my hands: If I simply let it go, it will select for its movement the direction of the earth's centre, describing a right line. I can, before it goes, predict to you a curve which it shall describe before it reaches the earth, as well as the vertical plane in which that curve shall lie, and the distance from me at which it meets the horizon, both with tolerable accuracy; and by the command of my will-force, the stone shall fulfil my prediction. When my will can thus combine at my pleasure with a physical force, compelling that force to work with will, as it works with another so-called material force, to produce the result which I command, will you still persist in your denial of a proper relation between will-force and physical? Go, talk of your eternal conservations, invariabilities, and indestructibilities! I can confute you, and spoil them all, within a certain sphere, whenever I please. For this 'I can' I give you all the proof that reason can require, by prediction and fulfilment: fulfilment that no other prophet nor philosopher can foretell; prediction that no other finite agent can accomplish.

(27.) I have had a long correspondence with a distinguished metaphysician about my beginning of philosophy, which ended by his claiming the victory

at this point, that I refused to define in terms exact enough for him what I mean by my will-force. He demanded my unit, and scale of measure; but I was unable to send him a pound of it for his examination. I can no more define it, than I can define 'I am.' 'I will,' with my will-force in conflict with difficulty inward or outward, is my starting-point, included in 'I am' when my will is in action at my beginning of thought. And so far from my being able to assign a scale on which it may be measured, this will-force is my only scale for the measurement of all other force of which I have accurate knowledge. I refuse to attempt further definition. I am bound either to describe and define it to an enquirer, or else to tell him, without ambiguity, how he may find my clear meaning for himself, as I find it. I refer him to the easy investigation which I have spoken of (19), into the fact of transition in consciousness, from purely passive sensation to active effort. I say, you are in your easiest garden chair, quite in repose in the sunshine, not moving a muscle. Ask yourself, What is the condition, necessary and sufficient, that I set myself to work? You know that nothing but main force can lift you from that chair, and set you and keep you working fifteen minutes at that roller. From what quarter is that force to come? Can it come into your consciousness otherwise than from

and by your will? If you can set it a-going, then your conscious state, when you flash it forth and moment after moment sustain it, I call the utterance and action of your will-force. But by this I do not mean the contraction of your muscles, nor the equivalent in pounds to their vigour. I mean something that has to be issued by you the thinker, before that contraction can begin. If you say that you find no fact in your memory or observation, marking the transition from conscious inaction and listlessness to conscious effort, then you and I cannot talk philosophy in this planet; we may hope to succeed better when we meet in Jupiter. I will not give you change in words, in much abused words, for this will-force, nor help you to mar and muddle what is clear, in wrangle without end. But this I will say, that I have not stolen the word force from Dynamics. I have justified my use of it in (15); and I beg that it may be understood, that when I call friction or gravitation a force in these chapters, I do it because I find them in measurable relation of more and less to my will-force.

(28.) I have frequently used the words *find* and *found*. When I speak of finding, as distinct from remembering, myself, my state of consciousness, my will-force in relation, &c., I use the word rhetorically; but the figure can do no harm. Finding myself is

affirming myself. But when I speak of finding anything which is not me-the-thinker, I use the word *find* in its proper sense: I always mean finding by facts of consciousness and logical inferences from them, in such wise that I can show you how to find the same for yourself, assuming that you are, like me, a conscious thinker.

(29.) In (21) I demonstrated without assumption from my starting-point 'I am,' that I have found a world of acting forces not my own, measurable from less to more by my will-force. I find them in measurable action all around me in loci or spaces more or less defined in magnitude and form, which I call *bodies*, my own found body being one of them. I find them also, *e.g.* in the forces which I encounter and measure in the atmosphere in its different states of movement and temperature, where the locus is too vast and too impalpable for exact definition in form and magnitude. Besides the forces which I can find acting, by coming into immediate deliberate and measurable conflict with them *in loco*, there are many which I cannot so find, and whose action and measure I infer by a train of reasoning beginning with 'I am,' such as the force of gravitation of the earth to the sun, those of high degrees of heat and cold which I dare not encounter, as also the molecular forces in solids, fluids and gases, in

light and electricity, which are too swift and small in their amplitude for my observation, but of whose tremendous action the best teachings of science forbid me to doubt.

(30.) Great as is my ignorance of the nature of the forces in action around me, there are three propositions about force of which I have demonstration, namely Propositions B, C and D following.

Prop. B. *The only force which is directly given and immediately known to me, is my own will-force; and all my knowledge of other forces acting in the Cosmos is mediate, and found by me by logical inference.*

My certainty that I have a will-force is founded on facts in my consciousness clear of all assumptions, facts which I can repeat at pleasure again and again.

This is demonstration *to myself*: my demonstration of this truth *to myself and others* is my power of predicted action. I can predict how often and at what intervals of time in the next three minutes I will lift this hand and pencil from the table and let them fall again. If I write down my prediction unobserved, I do not believe that any other finite mind can tell what I have written. Then with my watch in my hand I can fulfil the prediction; a thing impossible to be done by any other finite agent, unless

it be true, what I certainly do not believe, that some other has exactly my control over my will-force. To affirm this to be true appears to me to be a contradiction ; for no other thinker can affirm my 'I am, I can, I will.'

Thus I have demonstrated certainly that I have a will-force, from facts of consciousness; *i.e.*, my will-force is *directly* given and immediately *known to me as mine.* This is all that I pretend to know; for the mystery of consciousness and will, which is involved in the complete answer to the question 'what is ?' is to me, as I suppose to all finite minds, for ever unsearchable.

(31.) Of the truth of Prop. B as regards force not my own, with which I am at any moment in conflict, it is easy to find demonstration. Let a rope thrown over a pulley be supposed to be grasped at its extremities by you and me. We both pull with varying force, and both find resistance varying, as the hands variously rise or fall. But I do not know the initiating and free action of your will-force as I know my own, nor you that of mine: to neither is this force of the other directly given, but only mediately found and inferred. If now my end is fastened to a stone weight, instead of being pulled by me, the force that you still find resisting your pull is no more directly given to you than was my will-

force. It is found and inferred by you by the process of thought described in (21). If the force acting against you were directly given and known to you, you would be able to state something of what you know, more than this, that *a* force is acting against you. Can you decide by a pull at a rope, of which the portion at the other side of the pulley is out of your sight, whether you are opposed by a weight which you cannot lift, or by friction of the rope between two surfaces, or by the hold of a nail, or by the will-force of a man stronger than yourself? You can decide by an investigation only: in other words, the opposing force is inferred, and not directly given nor immediately known to you.

(32.) The truth of Prop. B as regards force at this moment acting with which you are not in conflict is included in the truth of the following; for such force has to be enquired about and found by a train of thought and action.

Prop. C. *My will-force is my only force-finder.* Finding here means the act of one who finds with demonstration, so that he can show me how to find. This is true whether the force found be one with which we can come into direct conflict by our exerted will-force, or whether it be one of whose action we obtain proof only by a train of reasoning from verified facts.

We have already established the truth of both B and C with respect to force with which we are in conflict. Of other forces in action at the present moment, some are such as we are accustomed to say that we *see* in action; but by far the greater number of them are those which we cannot see, namely the forces acting in bodies at rest. Let us test the truth of Prop. C with respect to one of the latter forces.

Suppose that you had reason to doubt, or thought fit, for argument's sake, to set up the doubt, whether there be a force in action in the wall apparently before you, which is sufficient to prevent your walking through that locus.

(33.) If you would learn to reason closely, you must learn to be a good doubter. Doubt, determined doubt, is the only key which unlocks the caskets of certain knowledge. We have so many lame philosophers, because we have so few thorough doubters. It is not the spirit of doubt, as we bishops and parsons sing, which hinders the progress of truth and religion; but the spirit of assumption. Why have we all these disgraceful divisions, wranglings and heart-burnings, in science and theology? It is not because men will doubt too much, but because they will not doubt enough. It is because they hate the trouble of doubting in themselves, and resent its reasonable demands in others, that we are flooded with sham

philosophies, superstitions, and infidelities. The good which the first Christians did, was their teaching men to doubt; and the evil which they suffered, they endured for teaching it.

To this it is no reply to say, that men are compelled to act upon probabilities. So they are; they never want the spur to do it; they never fail to learn by doing it, at their wholesome cost; and much of their ill-doing will be excused by that compulsion. It would be a reply to say, if it could be proved true, that we are compelled upon probabilities to neglect the pursuit of truth, when we have the means and the time to pursue it, and to emulate those who, with words of hatred and malediction, delight to dogmatize and domineer over the intellect and conscience of others.

One advantage of a mathematical training is, that it teaches a man to hold a doubt in his teeth, till it is torn out, as from the mouth of a lion, by the sheer force of demonstration.

(34.) Let me beg you to place yourself in that attitude of doubt about the wall, and to ask yourself what amount of evidence you would require to remove the doubt by verification for yourself. Would hard looking at the wall suffice? Not if you are a good doubter. Would it be enough, if, at your request, I walked up to the wall, and you saw and

heard me strike it with my stick? If it would, you are not likely to become a deep mathematician; you would mistake an inference, in which error or deceit was possible, for found demonstration. For real proof, you would walk up to the wall, and test it by the challenge of your will, in the exertion of your own effort. Resistance so found to the force of your will would be demonstration of a force acting against you, as good as your evidence of your 'I am,' 'I can' and 'I will.' And if you were asked, while your arm was pressed against the wall, Whence comes your certainty that force, not your own, is acting there? you would answer, Because I will in act and know that I will. If you did not know that you willed, you could not know that you were resisted and baffled, nor could you find the force in action against you, nor, consequently, the body called wall.

(35.) I presume that the reader is not one of those who cannot understand that, when they push at the wall, they are encountered by a reaction equal to their effort, and resisted by an opposite horizontal force due to friction and molecular action. Such persons require a lesson in statics; but every child can see that, if no force at all was at work in the wall opposing his will-force, his arm would certainly go through the wall, no matter what else might be there, whether called *matter* or *catter*.

(36.) There are persons who undertake to give an account of our knowledge of force acting in the wall against our push, without the least reference to will; they tell us that we are merely receiving the evidence of 'our muscular sense.' For this deduction of our knowledge of resistance, from premisses which affirm nothing about will, they have the countenance of J. S. Mill, who, in Book I., Chap. iii. § 7 of his 'Logic,' says,—'My conception of the table at which I am writing, is compounded of its visible form and size, which are complex sensations of our organs of touch and our muscles; its weight, which is also a sensation of touch and of the muscles; its colour, which is a sensation of sight; its hardness, which is a sensation of the muscles; its composition, which is another word for all the varieties of sensation which we receive under various circumstances from the wood of which it is made; and so forth.' Muscular sensation is here affirmed to be the instrument whereby we obtain our conception of tangible form and size, of weight and hardness; sensation seems to be all that is; and all allusion to the action of the will, by which the muscles are contracted, or of the force which we put forth in active conflict with resistance, is evaded. So that, when you are rowing or wrestling for your life, or forcing your way with all your might through a crowd, you are just as

purely and passively receiving impressions by their convenient invention, the muscular sense, as when you sit at perfect rest and receive by your nose the salutation of their learned pipes. When, instead of your old five senses, and your will-force, you are equipped with six mechanical senses, and all real distinction between active and passive is abolished, they can teach you matter-and-must-be Philosophy, and their lovely logical circles of Evolution. This *muscular sense* in my eyes is the paltriest of all their fictions, by which they vainly endeavour to conceal from view the fundamental difference between active and passive consciousness. When I am in a state of listless indolence with my eyes open, I cannot shut out the information of my five senses. Whether I choose it or no, I see, hear, taste and smell, and I touch, with perception at least of temperature, whatever is in contact with my skin. But it is impossible for me to obtain the verified perception of tangible form and size, of weight or of hardness, except on condition that I put forth the challenge of my free will-force. They will fight hard for their modern invention of a muscular sense, without which their philosophy will not for a moment hang together; but what have they to fight with? Must be so—We know! And what have they to fight against? The perpetual testimony of my active consciousness

and will! What dunces men have been for all these millenniums, to be able to count only five senses! Of course I do not deny that we are conscious both of effort and fatigue in voluntary muscular strain. The important truth, which the invention of the muscular sense is vainly contrived to hide, is, that the strain in all its duration and measures depends entirely, as our passive sensations do not, upon our will.

(37.) No denial of the truth of Prop. C (32) is to be apprehended, with respect to the action of force that we do not see, or fancy that we see. Nor will any reader competent to the study of this subject maintain that he can *see* an acting force. He knows that this is no more true than the assertion that, in reading a letter, he sees the thinking of the writer. He sees dumb symbols on paper which he has learned to translate into the conceptions of 'winged words,' and the words heard are but symbols which he has learned to interpret. We have all learned to translate the telegrams of light into memories and anticipations of actual conflict with external force; that is, into knowledge possessed by the born blind, and possessed as truly by ourselves.

(38.) Waiving this debate on the evidence of mere sight about motion and force, I am ready to grant for the moment to any reader who affirms it,

that, by accidental and quite passive impression on his eyes, he finds without the intervention of his will, by intuitive inference from found motion if he chooses, force in action in the falling snow, in the moving sails of the windmill, or in the bit of glass which is softening in his fire-grate. My question is, do you find it independently of your will-force, with demonstration, so that you can show me how to find it without the effort of my will? I am lying in listless inaction on this couch, while you are explaining how you find force in action, without what I affirm to be the only force-finder. Can you help me so to find it? You have at least to persuade me to take a look; but I cannot do that without an utterance of my will-force for the direction and focussing of my eyes. Nor would looking suffice to me in my sceptical mood, for demonstration. I should have to go through a process of thought in active consciousness, a process which could neither begin nor proceed but by the effort of my will. Nothing can evince to me the erroneousness of Prop. C, (32) but a case given to me, which I can verify when I please, that I can find acting force by any instrument besides my will-force. There is absurdity in supposing such an instance; because the effort of verification can be made only by my will.

(39.) At first sight there might seem to be weight

in such a question as this,—how can you affirm that your will-force is your only finder of the force which is softening that bit of glass in the fire, when you dare not encounter that force ?

I reply that, in finding such force with demonstration and verification, I must find the whole fact. I must first have the cold piece of glass in my hand, and satisfy myself that it is hard and brittle : I must then cast it into the fire, and prove by means of a tool in my hand, that it is there afterwards soft and flexible, and deduce by sound reasoning that the heat alone has effected the change. All this requires my will-force for my instrument.

Let me remind the reader, who thinks that he is able to find accurately either force or motion by his unassisted vision, of a fact which deserves to be recalled in every theme of science, that up to a time not four centuries ago, mankind saw, through thousands of years of increasing culture, the sun and stars revolving daily around this earth ; and that when Galileo was cruelly smitten by the highest tribunal of truth and righteousness then known for denying that they so moved, there were not a dozen men alive to whose judgment and conscience his punishment did not commend itself as just.

(40.) If the reader is a doubter good enough for the successful handling of these questions, he will

be able to test by his own experience the evidence of mere eyesight concerning the fact of motion. Has he never in a strange shop seen a figure advancing, which he thinks he ought to know, one evidently approaching him with the intention of accosting him, and has he not made several pondering steps to meet the unknown friend, before the truth has flashed upon him that he is walking up to a mirror? It has more than once occurred to me to be exactly thus deceived. But if we really saw motion with our eyes, we could not be so deluded by our trust in them, at the moment of our deliberate reasoning on their evidence. Again, has the reader never sat in a railway carriage at rest at a strange station, and felt interested in looking at the variety of faces flitting past him in the moving train on the other rails, and this for some seconds before he has found out that his own train and not the other is in motion, or *vice-versâ*? This mistake would be impossible, if it were true that by our eyes we are directly and immediately conscious of the fact of motion. It is true that a glance does generally inform us correctly of motion and force, as a glance at this page reveals my thoughts; but not without a rapid process of interpretation to which our will-force only has trained us.

(41.) My third proposition is the following:

Prop. D. In my every train of reasoned thought

about any force or forces found in action in the cosmos, the fundamental proposition out of which all my other propositions flow, and on the certainty of which their truth to me depends, is this—*In finding force, I will in act and I know that I will*; so that if all the steps of the reasoning be written down without omission in their order, this proposition must stand written at the head of all—*In first finding force in this enquiry, I willed in act, and I knew that I willed.*

I shall not detain the reader with further attempts to prove this proposition. If he is satisfied that Props. B and C are rigorously true, he will not be able to withhold his assent from this, as universally true and unassailable. We shall see the use of it in the sequel of our argument.

(42.) For a conclusion to this chapter, I may throw my remarks into the form of words spoken by A (17) at a subsequent period of his supposed experience. Speaking of our materialist philosophers he may be regarded as saying: 'Here lies their blunder, that they conceive the stupendous forces of nature, and along with them other human will and consciousness, to be all alike directly, separately and independently, given to them. They fancy themselves beings of a superior world, floating in the air, and looking down on man and the surrounding energies all objectively submitted to them, alike

human desires and human will, along with the other activities of heaven and earth, for their inspection and comparison. But the truth is, that no force whatever is given to them, but as a function of their own will—a function so to speak of the form $w.f(w)$, where w is the acting will-force—a function vanishing with w; that is to say, that if they were deprived of all consciousness and memory of will, no conception whatever of verified force would remain in them. Nor can they eliminate this w from their expression of any force, or from their reasonings about it. They may talk of the lightning's speed, or of the distance from earth of the furthest nebula, or of the living force of planets or of suns; but all these fine words are intelligible only because they suggest multiples of their own remembered will-effort. Will is not a force given to them externally among a number of other more commanding forces equally observed by them; nor can it be found or described as a resultant or product of such forces. The truth is, that no force of the external world is ever properly and directly observed, but rather inferred, by them, from their consciousness of baffled will.

CHAPTER V.

ON THE EVIDENCE OF THE PRESENCE OF SO-CALLED MATTER IN THE COSMOS.

(43.) WHEN I stated in (29) that I find in the cosmos encompassing me-the-thinker a variety of measurable forces, acting in more or less definite bodies or loci, the forces and the loci being found and measured by no other instrument than my will-force, I stated honestly all that I find; and I have shown the reader, without hard words or figures of speech, how to find them for himself at any moment. This is my notion of a beginning in Philosophy.

But can it be true that I have not found that most renowned and universal of all things, which they call *matter*, which is not force, but the condition of force; not motion, but the thing moved; not space, but occupying space? I confess that I am unable to find it.

Let the clear question now before the reader and me, assuming that I have a thinking reader, be this, —*Where and how can we find what they call matter*,

without assumption and with demonstration, so that we can show other people how to find it? Let it be observed that I am not propounding the question, What is matter? That would be a harder puzzle than was ever yet invented about x-ances, y-ities or z-ations. The philosophers who talk the most about matter in their atoms, never pretend to tell us or to know *what it is*, any more than *what ether is*, which they have somehow married to coarser matter; nor do they scruple to confess that they have not yet settled either its definition or their account of its properties. But they all 'discern' wonderful things *in* it, and seem to be agreed on these points,—that matter is not force, nor motion, nor space, nor shape; also that it is the easiest thing in the world to find, and that it is to be found anywhere and everywhere. I may therefore be excused, in such learned company, for using like them a word undefined and undefinable.

(44.) I seem to have the same senses and faculties with other men; but I cannot find this matter for myself, nor get at any conception of it, as distinct from force acting *in loco*. I do not say there is no *matter*, any more than I say there is no *catter*. It would be wrong in me to deny the existence either of matter or catter, so long as I am unable to form a conception of either. That I cannot define, or that

I cannot conceive matter or catter, proves and disproves nothing about the being of one or of the other. The common argument of profound philosophers,—We cannot conceive; it is impossible to conceive,—I hold to be worthless. If any charitable soul will help me by some experiment, simple or complex, to find for myself this dead, inert, space-filling matter, distinct from acting force encountered by me, I shall be most grateful to him; and I declare to you, that I will firmly believe and confess the existence of either matter or catter, whether I can conceive it or no, if you will only teach me how to find it, as I find force, at my pleasure without invoking *must-be.*

(45.) This matter appears to be a marvellous Jin or Gnome of philosophical faith or superstition; but, if I may speak candidly (so far as I have been able to investigate the facts of consciousness and of the cosmos given to my faculties), substance, substratum, matter or catter, supposed finite realities to man distinct from found force acting in found locus, appear to be fictions of ignorance, and all empty words without a glimmer of meaning, which to one of my sceptical turn of mind are fit only for ridicule where they claim to be science, as much as the physical or metaphysical 'must-be's,' which are the only guarantees produced for their existence. It is

useless to appeal to my modesty by your *argumentum ad verecundiam*. To the idealist I say, I can demonstrate that I am in a real cosmos of real measurable forces acting in measurable bodies, a not-me as real as my conscious being. To the materialist I say, I am quite ready to believe all that you tell me about your matter distinct from found acting force, and about its marvellous mathematical attainments and dynamical achievements, on one condition, which you cannot think unreasonable in a hardened sceptic, that you show me how to find it for myself, without assumptions and must-be's.

(46.) It is worth our while to dwell a little on this question of finding matter. Let me try to show the reader whither I am leading him. My notions are very old. The best of them were all stolen from me 100 years ago by that great genius Boscovich, whose contributions to a scientific genesis of the cosmos, in my poor judgment, incomparably outweigh all that has been done by Microscopists and Physiologists, and especially by those very lively writers the Biologists, Psychologists, Evolutionists, of the matter-and-must-be school, with their grand Sticktogetherations of Sticktogethernesses, or, as they put it in their more learned Latin, their 'Integrations of Coherences!'

(47.) I believe with Boscovich that the smallest

locus of force is a point without parts, and I agree with the thinkers who foretell that dynamical science will eventually begin where geometry long ago began. The starting conceptions will perhaps be stated thus,—in Geometry, from points which have unchanging positions and no parts; in Dynamics, from points which have changing positions and no parts. In the definition that dynamical points change their positions (the changes being referred to an adequate cause which works by laws of action depending on the number and distances of related points, and being for all finite observation and computation continuous changes), all that we mean by force and inertia is logically included, and would be stated in definitions or axioms following. And can we suppose that there is any one force-point for a definite time at rest? If, as men of science generally hold, each is behaving to every other in the cosmos in attraction, equilibrium, or repulsion, according to laws expressible in terms of distance, it is difficult to imagine that any should be in repose, if it were not the dynamical centre of all.[1]

(48.) The mathematical point of Geometry has survived the dangerous attack of J. S. Mill in Book II., Chapter v., of his 'Logic.' After correctly observing, that whatever follows from a definition 'follows

[1] Vide Appendix III.

in reality from an implied assumption that there exists a real thing conformable thereto,' he goes on thus: 'This assumption, in the case of the definitions of Geometry, is false; there exist no real things exactly comformable to the definitions. There exist no points without magnitude, no lines without breadth.' This is the attack on the geometrical point and the geometrical line. It is at least bold and dogmatic enough, like too many of this famous writer's deliverances. But is it all quite true?

Let P be defined as exactly the end of Judy's nose, the end at the nearest distance *d* from the mirror before which she stands. I shall not prove that the nose is finite and has a real end. How much of the nose does P occupy? If other words, what is the magnitude of P? If P occupies any parts or portion of the admired organ, through which the minutest section across *d* is possible, P is not exactly the end, but something more; *c.h.* If P occupies no parts through which a section is possible, it must either be a portion of a plane parallel to the mirror, and having no thickness; or a line, straight or curved, parallel to the mirror, and having no breadth; or it must be a real point P, having real position on a real nose, and having no parts. That is, P is really one of the geometrical elements which Mill affirms to have no existence!

Mill tells us, I forget where, that he had conscientiously studied mathematics. We are bound to believe that he went a good way. The preceding demonstration (for I say it is a demonstration) seems to prove that he never advanced quite so far as to the end of—But Judy's uplifted finger warns, No more!

(49.) I believe with Boscovich, what indeed the materialists generally affirm of their atoms, that no two force-points are in contact. All that is in my reach for observation or experiment, of a solid body hard or soft, I conceive to be a discontinuous film, infinitesimally fine, of superficial molecules or primary groups of force-points, which are prevented from leaving those behind them by attractions, often of tremendous power, and from more nearly approaching them by repulsive forces, which opposed forces come into action in turn, on every attempt to change in either direction the distance of the film from what is behind it. The distances between the molecules may be, if we could measure them (in a bit of glass for example), very vast compared with the size of the molecules, whose component parts, whether atoms or force-points, are quite unknown to us, as to their motion, arrangements, and distances. Thus the old puzzle of the infinite divisibility of matter is both silly and useless; silly, because it is absurd to talk of the performance of an infinite succession of

operations; and useless, if all bodies are at this moment divided, to a degree beyond which division is impossible, into distinct force-points without parts.

(50.) Assuming that I am in the presence of thinkers like myself, our question is, how can we find what is called matter? We find in plenty definite loci of force, called bodies, some in evident motion, others to our perceptions at rest. But we cannot prove that any solid body is absolutely in repose, and few men of science doubt that all around us is in a state of perpetual vibration invisible to us. Shall we look for matter in things visibly moving, or in things to us at rest? The latter are more convenient objects for close examination; we can make little of flying cricket-balls. And it is most fortunate that all the assertors of matter are unanimous in affirming, that the matter in a body is all the same in every respect, whether the body be moving or motionless. The arguments for the reality of matter, such as they are, are generally 'must-be' appeals to bodies in motion; and the defenders of matter cleverly fancy that they have won the victory, when they have charged Boscovich and his followers with the absurdity of believing, that motion takes place when nothing is moved. But so far from pretending that nothing is moved, these latter know, and they teach like other people; that the

manifestations to them of force in bodies, which manifestations are all that they find and reason about as things, are perpetually changing, or ready to change by dynamical laws, their position, and are all realities, not nothings. What is there in this of empty words, or dreamy doubt?

(51.) From the molecules upwards, if we consider molecules to be primary aggregrates of force-points or atoms, the notions of Boscovich about dynamical science differ in nothing that I am aware of from those of the materialists. Nor, practically, downwards from the molecules to their components; so that the folly of believing in motion where nothing is moved may be charged on either school with pretty much the same show of reason. So long as you confine yourself to the departments of what may be called cosmology, without intruding into that of cosmogony, which, as we lately learned from Professor Tyndall at Belfast, has been finally placed under the control of himself and his scientific peers, you may make your ultimate moving atoms as small as you please—in fact, for all conception of men, and I suppose of angels, simply moving zeros.

(52.) Ask one of these learned doctors, What is the actual size of your minimum atom? He may consistently reply, 'Write first your decimal point;

after that a few billions or trillions of zeros, and at the end a 1, or any other figure you please. That will do for the diameter in inches of our atom, in the molecules of light or of lead.' If, enjoying your task, you begged permission to add a few more millions of zeros, he might reply: 'You may carry on your line of zeros from here to Aldebaran, if you choose, provided that you put down a 1 at the end.' If you should venture to ask of what use the 1 can be in that remote decimal place, he will say curtly: 'That is our affair, and a long way out of your depth; that belongs to cosmogony. Besides, our friends the Atheists must have an eternal cause: they cannot do without a Deity. Would you break the heart of their Theotokos Must-be, by kidnapping her little one, and depriving them of their religion and their God?'

(53.) Let me invite the reader to place himself for argument's sake in the posture of doubt about the reality of this renowned 'matter,' which is not force nor motion, but an inert unchangeable something which occupies space, and is the undefined condition and the actual atomic vehicle or stool of force. I ask him neither to affirm nor to deny that the stool is there, but to be looking with the eyes of a sharp sceptic for evidence found by himself, and to be determined to name and register exactly what he

finds, not being imposed upon by assumptions, must-be's, and empty words.

We may confine ourselves to bodies at rest or within our reach, for if the matter is to be found, it can be found without the complexities of motion. That is confessed by all. Suppose that you have before you a cannon ball, a bar of lead, a block of oak, a bundle of wool, and a pail of water, all of the same weight; and therefore, as all affirm, containing the same amount of matter. By feeling them, pressing them, or attacking them with hand or tool, you convince yourself of the presence and action of very different forces in the loci or bodies. Solid mass can be reduced to powder. By rolling the ball on the table, you can make it the seat of varying and even of dangerous force; and if you roll it off the table, it will descend with ever-accelerated speed and augmented force, so that while you can stop it after a fall of an inch, it is not pleasant to try that, if it be a 60-pounder, at an inch from the ground. Then you can think of the change of the water into ice or steam; marvellous transformations of force, from solid to invisible. But in all these variations of the acting forces, easily verified and found by you, the amount of matter in each locus remains unchanged, they say. The matter may be there; but it cannot be what we find, alter, compare and re-

member. Whatever the matter may be, we have not thus far detected it. We can make theorems about force and work done, or about force and heat; but in all this there is nothing which reveals this *matter.*

(54.) Let us come closer to the question. It is not from movement or change of form that people frame their notions of matter. One man will fancy that he has settled the business by putting a pound weight into my open hand. There it is: feel for yourself. But it is easy to show that the weight of a motionless body is not the same thing with the matter of it, and that feeling, or remembering the weight, is not feeling or remembering the matter.

Not to speak of the difference in the weight of bodies to a diver under water, nor of the effect of a strong magnet held over an iron weight in a scale, it is certain that weight itself alters in the air, while the so-called matter remains unchanged. If a pound suspended from a spring-balance is carried up to a sufficient height in the atmosphere, the indicator will show a lessened weight; for, as we all know, weight is simply the attraction between the earth's centre and the heavy body, attraction which diminishes as the square of the distance increases. Nay, if a pound be suspended from a spring-balance sufficiently delicate, and left standing on a table, it is certain

that, if we could read its minutest indications, the weight would not be registered the same for a single hour. The weight of a body at noon is the attraction of the earth upon it diminished by the attraction of the sun, which in the orbit is then exactly opposed to the earth's; but the weight at midnight is the sum of the attraction of the earth and sun, the little moon being neglected. I know not where I have seen it affirmed by scientific authority, that it is within the competence of mechanical skill to construct a spring-balance, that shall exhibit to the unassisted eye the evident increase, between noon and night, of the gravity of a suspended ton. Thus we see that in finding, altering, comparing and remembering the weight of a body, we are not getting for ourselves evidence or verification of what they call its unalterable matter. We are quite sure, from consciousness and will, of the acting and varying force, because we can find it when we please, and we believe it to be due, just where we find it, to the behaviour of the molecules in the locus to the surrounding cosmos. But we are poor doubters, if after finding this force for ourselves in conflict with our will, or with another force like that of a spring, whose indications we have tested and graduated under appeal to our will-force, we allow ourselves to slip into the unsupported conclusion, that the force

found is due to something unknown called matter in the locus. We have not yet detected this matter either within or without us; and we have no right, in rigorous science, to talk of it.

(55.) Few persons, after all, mistake weight for matter. It is not their encounters with vertical forces like gravitation, but their more frequent collissions with horizontal forces, which suggest the notion. It is when a man is pushing before him on the table his lamp, his desk, his tools or books of different sizes, that he is most convinced that he is giving motion, not simply to a locus of measurable force, but to what is talked about as matter; or when he is trying to push his table along the floor. It does not often occur to him, that he is in conflict with nothing but the mysterious force of friction. The truth is, that if all friction could be destroyed between the perfectly horizontal surfaces, a puff would send everything off the table, and a blow with a cambric handkerchief would set the table spinning across the room; for vertical gravitation cannot at all counteract horizontal impulse.

(56.) When you strike the marble mantel-piece, you may feel certain that matter is there; yet you have merely attacked that infinitesimally fine film of superficial molecules, which have yielded, it may be, a millionth of a hair's-breadth, and come back with

speed beyond conception in recoil. You have attacked it: I do not say you have come into actual contact with it; for it is believed that the repulsions acting at close quarters make such contact impossible. When you hold a crust, a cigar, or a bullet, between your fingers and thumb, you may think you are in a position to pronounce on what is, as well as on what is manifested to you, and may be convinced that you are finding unvarying matter; but you are simply encountering a variable or fixed resistance acting in the locus; and everyone can see, that if no force at all was in action there against his will, his finger and thumb would meet in spite of the supposed matter between them. When you are wrestling with the gale, you are storing your memory with evidence of what is called the matter of the atmosphere; but if you had never encountered air in motion, you would hardly have found it to be either substance or matter like the solid ground. In all this, I take it for granted that the reader is too good a doubter to allow his eyes to settle the question.

CHAPTER VI.

SOMETHING ABOUT BOSCOVICH, BERKELEY, AND KANT.

(57.) IT may be useful to show what Boscovich considers to be the nature of cohesion in solid bodies. Let A and B be two molecules or two atoms in cohesion. Nobody supposes that they are really in contact. Let them be a billionth of an inch apart, a vast distance probably compared with some intervals of cohesion. Boscovich talks not of a single force-point, or particle, but always of the behaviour of one to others. He supposes that if A and B were placed at a distance from each other greater than A B, that of cohesion, they would attract each other by one of God's laws; and that if the distance between them were less than A B, they would, by another law, repel each other; but that A B is the exact distance at which they neither attract nor repel each other, till disturbed by some force. It may be that they are normally in a state of vibration across the limits of the interval A B, which neither can cross without

being compelled to return. The force at work and the speed are beyond our power to imagine.

It is easy to construct a force-function comprising many distances of both stable and unstable equilibrium, of which our gravitation formula may be seen to be a truncated portion, *i.e.*, a function which becomes that formula when quantities, which vanish before our great cosmic measures, are neglected.

Thus, to give a simpler function than what Boscovich handles—

$$\text{M}.\frac{r-a}{r}.\frac{r-b}{r}.\frac{r-c}{r}\ldots.\frac{r-i}{r^3}$$

is, when r is incomparably greater than any of the constants $i. \ldots c$, b, a, supposed in descending magnitude, the same for all our means of observation as $\text{M}r^{-2}$; but it vanishes when $r = i$, and becomes negative for the next smaller values of r. The distance i would be an interval of cohesion, at which gravitation ceases, and below which a repulsive force begins to operate. There may be in the last visible breadth of distance between two molecules a vast number of Boscovich's intervals of cohesion and non-cohesion, *i.e.*, of equilibrium stable and unstable, where the force acting passes through zero from positive to negative, and *vice versâ*. Will the exact interval i of cohesion, at which gravitation between

two bodies vanishes, ever be discovered? If it ever is, it will be a proof of design which will puzzle our Necessarians and Materialists.[1]

(58.) We have good reason for believing that, if two particles or bricks could be carried away into outer empty space, and there simply placed above 4,000 miles asunder, out of the reach of all forces acting from any other bodies, they would approach each other by one of the laws of force known to us. But if they were placed one inch or one hundred miles asunder, no man can say how they would behave to each other; for we can make no free experiments on the force of gravitation with two particles but by taking the earth's centre, 4,000 miles away, for one of them. There is no doubt that there is a near distance of two particles, at which gravitation ceases; nor is it improbable that there is a very vast distance where a like change occurs, and the law of acting force is altered, we know not into what law.

(59.) Without the help of so-called matter, we can form consistent notions of the manifestation of Divine Energy in pure force-points. If a right line C D revolves about its centre, C and D describe a circle; and if the circle revolves about one of its diameters, C and D move always in the surface of a

[1] See Girdlestone, *Number, a Link between Divine Intelligence and Human*

sphere, being always at the opposite ends of some diameter of the sphere. We may conceive the rotations to be such that C and D shall cover the surface of the sphere at any speed with spirals, unrepeated in long time *t*, of any degree of closeness or density. Instead of a right line C D, let us think of two force-points C and D immeasurably near together at a distance C D of cohesion. For the revolutions we may take higher velocities than that of the 500 billions of wavelets which strike the velvet of our retina in a second. How this is to be done, we are just as competent to explain as the matter-doctors, when they set their atoms or molecules a-spinning. We thus imagine a spherical locus of force, in every conceivable differential element of which one of the force-points C and D is present, and exchanging energy with the rest of the Cosmos, millions of times in every millionth of a second. Does the reader believe that the sharpest philosopher among the Seraphim, if he got that into his microscope, or could feel it on his tongue, could distinguish it from a round shot of solid matter? Yet although to finite perception an impenetrable, unapproachable atom, it would be simply two of God's force-points having changing position, but no parts. We do not want their matter to help our poor endeavours to think on this awful border between science and adoring

faith. We can make our own round atoms if we require them. But who knows that the fundamental forms are spherical? They may be in molecules, and in the grandest sidereal groupings also, polyacrons plane and solid, having for edges very nearly the distances of cohesion of Boscovich, modified by the mutual action of non-collateral summits of the polyacrons.

I trust that the reader sees with me, that a doubt of the existence of this matter, which is not force nor motion, may reasonably rest in the mind of an exacting sceptic after all the experiments in his power. That doubt once established has a wholesome and a devout habit of growth; for there is nothing of dreamy metaphysics, nor of dogmatic absurdity, in these notions of Boscovich. The Materialists cannot find their matter, nor describe it; and at this moment they are further than ever from all hope of defining either their ether or their atom. Both stand in their heads for something-sticking-together-by-force, something unconceived, while the meaning of force, resistance, and space is actually known, alike 'by Savage and by Sage.'

(60.) To me it appears that, while speculations like those of Berkeley and Kant have for thousands of years done good service against the old superstition of Duality, which set matter in antagonism over

against God, their extravagance has produced a reaction in favour of the reality of so-called matter. It is frequently remarked that Berkeley is unanswerable, and as frequently added—No matter, 'tis what Berkeley said. It is not a wholesome state of thought which treats as folly the acceptance of confessed demonstration. That is a Vatican suicide of reason.

It becomes me to speak in subdued tones of the logic of a Berkeley. But I can never cease to regret, that he appears to have missed or ignored that radical dichotomy of thought into active or passive consciousness, from which I believe that all our real knowledge springs. He begins from the first to deal in the same breath with the ideas of temperature and hardness, as if the will-force had nothing more to do with the one than with the other. Thus, at the beginning of 'The Principles of Human Knowledge,' he says, 'By sight I have the ideas of light and colour, with their several degrees and variations. By touch I perceive, for example, hard and soft, heat and cold, motion and resistance, and of all these more and less of quantity or degree. Smelling furnishes me with odour, the palate with tastes, and hearing conveys sounds to the mind in all their variety of tone and composition.' And in the first dialogue between Hylas and Philonous, we

read :—'*Phil.* And when by my touch I perceive a thing to be hot and heavy, I cannot say, with any propriety, that I feel the cause of its heat or weight.'

(61.) In his Belfast Oration of August 1874, Prof. Tyndall has reproduced this oversight of Berkeley, in treating touch with volition, effort, and pressure, exactly like involuntary sight and smell. After showing that mere vision gives no demonstration that you are there, he adds : 'And if I urge that I can check my sight of you by touching you, the retort would be, that I am equally transgressing the limits of fact ; for what I am really conscious of is that the nerves of my hand have undergone a change. All that we hear, and see, and touch, and taste, and smell, are, it would be urged, mere variations of our own condition, beyond which, even to the extent of a hair's-breadth, we cannot go.' He means that this would be correctly urged against the evidence of enquiring touch. But, if the reader can trust his own consciousness more than the dogmas of doctors, he can see the difference between the witness to an external world of his passive 'I am,' when, without volition or against his will, he merely smells musk or tobacco, and the louder witness of his active 'I am and I will,' when at his free choice, and as long and as often as he chooses, he touches with more or less enquiring pressure of acting will-force. Prof.

Tyndall speaks as if no such difference existed between these testimonies of active and passive consciousness. And the whole Materialist school of philosophers affects in the same manner to ignore the dreaded difficulty of free-will. They have tried to repair the oversight of Berkeley by their invention of 'the muscular sense,' that most bungling of all their devices to simplify the Cosmos (36).

(62.) The just repugnance felt to Berkeley's theory seems to me to arise from its abolishing the reality of space, force, and motion, as well as that of so-called matter. Here let me add the remark, as not quite foreign to my purpose, that Kant, observing this, went on to abolish the reality of time also, and without a syllable of proof, other than beggarly must-be's and displays of *per se's* and of long-tailed abstracts, he decreed that time and space are in themselves and out of us nothing real at all, but only 'forms of our intuitions.'

I know that the Metaphysicians as well as the Materialists will shriek and threaten, if I touch such grand *arcana* as *matter*, *form*, and *substance*. I can face the storm. For their trope *substance*, in any proposition which they call scientific, even in Spinoza's formidable array of long-winded definitions, lemmas and axioms, I have as much reverence as for the Hindoo tortoise that supports the

elephant; and for their trope *form*, in such a theorem as this of Kant, I have as much admiration as for all ghosts in the abstract in general. It is a great art, this winding of invisible science on that shadowy figure of a bobbin, Form.

(63.) I have in my memory Kant's definition of the form of a phenomenon, which is actually clearer than that of its matter :—'The *form* of a phenomenon is that which gives to the manifoldness or multiplicity of the phenomenon its capacity of being arranged in certain relations.' I dismiss the muddle and the rhetoric in this scientific monosyllable, and demand its sense. Form means nothing but a definite arrangement of points, closed or not closed, in space. If you choose to stick *form* into your theorems, I shall look into space for a meaning. Our intuitions are affirmed to be real, and their form, if belonging to them, whatever it may be, is as real as they. Space in itself, says Kant, like time, is transcendentally ideal and nothing real at all, in the cosmos outside of us-the-thinkers, because it is only a form of our intuitions. It sounds mighty deep; but it amounts just to this :—Space in itself is unreal, because it is only the real defined space of our real intuitions. With that mortar and that shell, manufactured by himself out of space, Kant blew time and space out of creation! The philosophers who wear

these cobwebs in their brains, are welcome to their remark, that I cannot understand it. Perhaps that great understander, the tortoise, can.

We are agreed about what we mean by space. It is the found position of found acting force, the answer to the question of memory, Where found? Into the question, What is the absolute and transcendental? we have, most of us, no faculties for entering, and small encouragement from the results of those who have tried it.

(64.) I have ventured to remark above, that Kant's definition of the form of a phenomenon is clearer than that of its *matter*. The uninitiated reader needs to be informed that common space-filling matter and metaphysical matter are quite different things. The question exactly before us is, how to find the former sort of matter. About the latter sort I tell him all I know, when I give him Kant's definition of the matter of a phenomenon, in the second page (after the Introduction) of his 'Critic of Pure Reason;' thus: 'By the *matter* of a phenomenon, I mean that which therein corresponds to the sensation.'

If the reader desires to know in what language or record, in what picture or imitation, or on what register or scale, he is to look for the *correspondence* between the sensation and the metaphysical matter,

I cannot help him. I can only tell him that the *matter* here talked of is not that space-filling stuff of which we are in quest, and warn him that nothing like a relation is to be admitted into his notion of this *matter*, not even the relation of correspondence; because the *form* of a phenomenon, quite distinct from its *matter*, is that which alone makes possible a sight or a statement of relations in the matter, or in any other part of the manifoldness of a phenomenon. That the reader may help himself without stint, I give the original German of my quotation :—'In der Erscheinung nenne ich das, was der Empfindung correspondirt, die Materie derselben, dasjenige aber, welches macht, dass das Mannigfaltige der Erscheinung in gewissen Verhaeltnissen geordnet werden kann, nenne ich die Form der Erscheinung.' It is a useful way of learning the value of these transcendental generalities and distinctions to take some single phenomenon—for example, a duet of steam-whistles, a whiff of Limerick twist, a smashed hat, a tight boot, a thorn in one's finger, or a pill in one's mouth—and to practise one's self in distinguishing the metaphysical matter of it from its metaphysical form.

I hope to be pardoned for this little digression on the substance, form, and matter of the metaphysicians; nay, I may earn the thanks of the

matter-and-must-be doctors with whom I have chiefly to do, by showing that the muddle of metaphysics about the same word *matter* is quite equal to their own.

The opening sentences of a book professing to be rigorous science are those which should be most closely examined. The first definitions above all should stand any strain of logical testing. One trick of sophism there is enough, nay is sure, to vitiate a whole volume. It is a dangerous thing to attack such a giant of reason as Immanuel Kant; and what I here say I am quite aware that I say at my peril.

I say that these two definitions of matter and form, on the second page following the Introduction to the 'Critik,' are just two metaphysical mud pies. In the first we have the verb *correspondirt*, a mere trope, that may mean something or nothing definable. What it is intended to mean ought to have been where it certainly is not, on the surface, and patent to the reader. In the second we have one of the worst of logical vices, a fundamental definition in terms of the indefinite and unknown.

It is a curious thing that the German adjective *gewiss* and the English *certain* are equally sophistical, in spite of their claims to precision and decision. The quality for which either word stands is either

certainty or uncertainty, just as the speaker chooses. There is no ambiguity in either, when employed absolutely ; as, Ich bin gewiss—die Sache ist gewiss ; I am certain—the thing is certain : nor when qualifying some logical terms in company with numbers ; as, zwei gewisse Gründe, two certain reasons ; drei gewisse Schlüsse, three certain conclusions : vier gewisse Sätze, four certain propositions. But when a man informs us that a certain person has certain reasons for arranging certain things in certain relations (in gewissen Verhältnissen), he tells us nothing fit to be written down in a page of science. If, instead of 'in gewissen Verhältnissen,' Kant had written 'in gewussten Verhältnissen,' in known relations, his definition of Form would at least have had a promising meaning. But his phrase 'in certain relations' is of no more value to the student than if it were 'in x relations.'

It will be dangerous for an admirer of Kant to maintain that the 'certain relations' are meant to include all real relations assignable. For as the matter and form of a phenomenon are conceived to be always found together and inseparable, there must be a real relation between them. Now every such relation must owe as much for its possibility of being formed, or found, or thought of, to one of its terms as to the other. Neither term can pretend to bestow

upon the manifold all its capacity of forming a relation. Yet if Kant's definition be generally sense, this pretence must be ridiculously maintained by one term only of the real relation between the matter and form of a phenomenon, or of that between the phenomenon and its matter or its form. All these are among the relations in which the manifold of the phenomenon can be arranged. This is just as wise as if one should affirm, that the relation $\frac{2}{3}$ is indebted for its reality and possibility to the number 2, and to that alone. What is this but sheer nonsense? They who choose may admire the circularity of these two mud pies. I say they are nothing like science, whatever decoration they may be to Kant's grand discovery of the unreality, out of me, of space and time.

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CHAPTER VII.

CONTINUATION OF THE SEARCH FOR SO-CALLED MATTER, WITH THE HELP OF ITS ASSERTORS.

(65.) AFTER the small success that we have had in our endeavour to find for ourselves this famous *matter*, I may put a clear question to the reader, who may be desirous with me of beginning his philosophy without unproved assumptions. Whether does he prefer to begin his conceptions of what is going on around him-the-thinker with the pure force-points of Boscovich, in which the will of the living God is energizing with perfection adorable of Science, and with a purpose of progress and unfolding of a benignant counsel for all—or with the blindly driven atoms, whether sailing or not in a nondescript ether, of the matter-and-must-be philosophy, atoms uncaused and eternal, and endowed with most marvellous mathematical powers?

Before he answers this question, it is only fair that he should listen to what those philosophers have to say in reply to my arguments, from my inability

to find, and from their inability to define this matter, or to teach me how to find it.

After my most careful enquiry, with such faculties of scientific research as I have, I know of no replies in the world that they make or can make, except their everlasting 'must-be,' defended by sophisms and vicious circles, and their all-subduing 'we-know.'

(66) I have before taken the liberty to express my opinion of our friend 'must-be.' I beg to repeat it with tenfold logical scorn. Why should I, a free-born Englishman, do reverence to the most magnificent, peremptory, and arrogant of gentlemen, just because neither he nor his friends can say anything in support of his pretensions?

No man ever yet answered a question with '*must-be*,' or '*can't-possibly-be*,' if he knew how to give a reason; and if he gives a good logical reason, his answer is a *must-follow*. Think it over as long as you please, and in any presence, however imposing: you will find that the *must-be* and *can't-be* of the necessarians and all that school are in every case, in every case I say, either the refuge of despairing, or the mask of pretentious, ignorance. That *can't-be* of theirs, if unchecked by hard doubt and hard logic, may soon become a dangerous *shan't-be*.

(67.) The most learned of the matter-and-must-be teachers, disdaining all demand for proof, and

strong as Galileo's mocking world in the unreasoned first half of 'common sense,' content themselves in general with bare dogmatism. They say, there must be matter where force is in action: matter must be the vehicle, the subject of the force. I want none of their tropes of seat or subject. I can find and remember in what place and measure I encounter acting force. I can define force without matter, and in that definition can tell them as much as they can find and tell to me. Force, of which I have a clear notion, is any found resistance to my exerted will-force, verifiable and measurable by my will at my pleasure in active consciousness. That is my closest definition *to-myself*, quite free from ambiguity and assumptions. A remoter definition sufficient *for myself and others*, is that given in dynamical treatises—force is that which gives rise to motion. If a brick falls on my head, or a sword enters into my body, I receive a sudden pain and injury; but it is not from such events that I get my notion of acting and measurable force. It is by deliberate challenge and encounter of my will that I learn it. With the matter-philosophers it is a principle in their books, that *no immaterial force* is to be confessed or admitted. In a word, their dogma is, that all the force of which science can discourse must act from matter upon matter, to

which many of them add, in matter. This, must-be, must-be, must-be so; it is impossible to be otherwise! The less learned endeavour to help you.

(68.) It used to be a familiar notion, that the force acting from matter upon matter, say between two attracting atoms not in contact, acted in a line through pure void space, or would continue so to act, if the intervening space were perfectly void: that is, it was not thought necessary that the path or direction of the mutual force should lie through a *plenum* of matter of any kind. This notion seemed inconsistent with the assertion of a necessary bond between acting force and matter, in every point of space through which force is transmitted. It is not to be wondered at that Boscovich, thinking of the line of force between two atoms, should say to himself—If there is no need for the presence of inert matter as the condition of acting force at any point of the line between the attracting atoms, why should it be a necessary condition of such action at the extremities of the line? Wherefore there has been recently invented an ether, in which atoms, or at least molecules, move. Whether its inventors assert that this ether absolutely fills the space through which transmitted force acts, being a sort of fluid which is perfectly continuous, and yet perfectly yielding and giving place to matter which is not ether, is not quite

clear. It is certain that an atomic volume of the ether in every locus P is ready to disappear from it, when an atom desires to occupy the locus, and to betake itself somewhere else, I suppose to the locus vacated by the moving atom. The disappearance of the ether from P is of course gradual, as the occupation of P by the atom is. Such a mediating ether evidently has separable parts, which are conceived as material and which change their places, and are loci of force in transmission in turn.

It is difficult to make out what our philosophers mean us to understand by their ether as something distinct from their solid atomic matter. The only attempt at a scientific definition of ether that I have met with is that of Professor Tyndall at p. 140 of 'Fragments of Science for Unscientific People'—'My condition might well resemble that of the ether, which is scientifically defined as an assemblage of vibrations.' It is not easy to point out anything in space of which this is not an equally scientific definition. By *scientifically*, the Professor evidently means scientifically enough for unscientific people: definition by a mere circle of *-ations* does not often satisfy men of science. Science demands —vibrations of what? of course of ether, which is by definition an assemblage of vibrations. That is, ether is defined as 'an assemblage of vibrations

of an assemblage of vibrations &c.,' *ad-infinitum.* To 'crown the edifice;' nothing like a circle! People readily form the pictures dictated at p. 179:—

'Picturing in imagination the atoms of elementary bodies as little spheres, the molecules of compound bodies must be pictured as groups of such spheres.' The notions of atoms separated by intervals of space from atoms, and of molecules separated from molecules, are clearly conceived. And all around these is poured the ether which 'not only fills the celestial spaces, bathing the sides of suns and planets, but encircles the atoms of which those suns and planets are composed.'

'Now light is known to move with the astounding velocity of 185,000 miles a second. How is such a velocity to be obtained? By boldly diffusing in space a medium of the requisite tenuity and elasticity' (p. 133). 'This universal medium, this light-ether, as it is called, is a vehicle, not an origin, of wave-motion. It receives and transmits, but it does not create. Whence does it derive the motions it conveys? For the most part from luminous bodies. By this motion of a luminous body, I do not mean its sensible motion, such as the flicker of a candle, or the shooting out of red prominences from the limb of the sun. I mean an intestine motion of the atoms or molecules of the luminous bodies' (p. 135). 'Bring

your imagination once more into play and figure a series of sound-waves passing through the air. Follow them up to their origin, and what do you find? A definite, tangible vibrating body. It may be the vocal chords of a human being, it may be an organ-pipe, or it may be a stretched string. Follow in the same manner a train of ether-waves to their source; remembering at the same time that your ether is matter, dense, elastic, and capable of motions, subject to and determined by mechanical law. What then do you expect to find as the source of a series of ether-waves? Ask your imagination if it will accept a vibrating multiple proportion—a numerical ratio in a state of oscillation? I do not think it will. You cannot crown the edifice by this abstraction. The scientific imagination which is here authoritative, demands as the origin and cause of a series of ether-waves a particle of vibrating matter, quite as definite, though it may be excessively minute, as that which gives origin to a musical sound. Such a particle we name an atom or a molecule. I think the seeking intellect, when focussed so as to give definition without penumbral haze, is sure to realize this image at last' (p. 136).

What image? That of an atom or molecule in vibration. But why *at last*? Oh, says the unscientific reader, we are never thinking of vibrating

atoms or molecules when we think of ether-waves. We know that ether is matter, but not discontinuous matter like that made up of atoms or molecules. It is only 'an assemblage of vibrations,' a 'rush of wave motion,' 'an aggregate of waves,' all quite dense, not broken by gaps or intervals of any kind, and all wonderfully elastic.

This is the conception of ether inevitably impressed on the unscientific reader by those pages of Professor Tyndall which he can understand. This ether fills up all the cracks of thought with great success. It is puzzling to think how matter moving in one place can cause matter to move in quite a different place: it is hard to conceive of a body acting where it is not, and of the transmission through empty space of light or of gravitation from suns to surrounding worlds. But these ether-waves can do it all, and bridge the gulfs between matter and matter in all the universe. Its motions spring 'for the most part from luminous bodies;' but obviously it can easily be the vehicle of gravitation, electricity, and all that.

In fact, continues Professor Tyndall's unscientific disciple, there are two kinds of matter—particle-matter, which is all atoms or molecules—and ether-matter which is all dense elastic waves, without chinks or divisions. This is exceedingly lucid, but unfortu-

nately not one bit like Professor Tyndall's own notion of ether. His ether is neither more nor less than discontinuous particle-matter, apparently more minute and attenuated than the matter of ordinary bodies. It has 'individual particles.' At p. 267 he writes: 'In the case of sound, the vibrations of the air-particles are executed in the direction in which the sound travels. They are therefore called *longitudinal* vibrations. In the case of light, on the contrary, the vibrations are *transversal*; that is to say, the individual particles of ether move to and fro *across* the direction in which the light is propagated. In this respect the waves of light resemble ordinary water waves more than waves of sound.' Professor Tyndall is quite aware, when he is talking of any waves in air and water, that neither water nor air is continuous, but that both are made up of molecules standing apart from each other, and no two ever touching each other, so that the fluids contract in a measurable degree by cold. His ether is made up also of separate particles. He knows that to affirm the absolute continuity of the atoms of his ether is a flat contradiction to its elasticity; that is, that there could be no vibration nor mutual resilience in waves, among the ether particles, if there was no free space between them to form an amplitude, whereby a particle at one moment is one of a moving throng in

dense compression, and at another swinging over nearly the same path in a comparative desert of rarefaction, the compression and rarefaction not being due to changes in the paths traversed, so much as to the number of particles abreast in the paths. Such is the molecular play of waves in water, air, or ether.

He shows that there is plenty of this free space for vibration in his ether-matter. At p. 137 he says: 'The waves generated in the ether by the swinging atoms of luminous bodies are of different lengths and amplitudes. The amplitude is the width of the swing of the individual particles of the wave [*i.e.* of the individual particles of the ether] . . But the light-producing waves differ markedly among themselves in size, form, and force. The length of the largest of these waves is about twice that of the smallest; but the amplitude of the largest is probably a hundred times that of the smallest. . . . And if we take the whole range of solar radiation into account, its non-visual as well as its visual waves, I think it is probable that the force or energy of the largest wave is a million times that of the smallest.' This means that the largest amplitude in space (not the force) of a swinging particle of ether is a thousand times the smallest.

I question not the correctness of all that Professor

Tyndall lays down about what is known to philosophers on ether-waves. He and Boscovich would agree, I presume, that ether is like every other body composed of discrete vibrating molecules, whatever unscientific people may imagine. The two would differ only in their account of the ultimate components of the molecules. Nothing that our philosophers have to say about this ether would be altered in value by the substitution of points, having changing positions but no parts, for its nondescript atoms. If there be any persons who value the invention of this ether, as something different from what is called matter, for the escape which they think it offers from the old difficulty of bodies acting where they are not, and of the transmission of force through empty space, I leave them to the applause of the convinced 'unscientific people.' I merely say that, instead of abolishing the gulfs between body and body, it multiplies them enormously. Cannot they invent a still finer medium in which to swing 'the individual particles' of their ether?

It is seldom the lot of the scientific to master the problems of the Cosmos either as to cause or mechanism. The unscientific are luckier. They felt no doubt quite unanimous with the voice that said to them at p. 133: 'Having mastered the cause and mechanism of sound, we desire to know the cause and mechanism of light. We wish to extend our

enquiries from the auditory nerve to the optic nerve. There is in the human intellect a power of expansion—I might almost call it a power of creation—which is brought into play by the simple brooding upon facts. The legend of the spirit brooding over chaos may have originated in a knowledge of this power.'

This notion of ether may be either viewed from the scientific standpoint as an expression, in further detail and for easier handling, of old difficulties about force, or from that of unscientific people, as a solution 'having mastered the cause and mechanism' of light. Considered from the latter point of view, it is pleasing and popular enough, but hardly equal in cleverness to the happy thought of Paddy, who, being ordered to clear away an unsightly heap of rubbish and brickbats, brooded awhile over the chaos with the power of his intellect, and finally decided there and then to dig a hole and bury it.

(69.) There is no way conceivable of showing that the notions of Boscovich are irrational, but by proving the absurdity of his conception of pure force-points at rest, or of the same in motion. These writers grant that it is scientific to think and speak of two atoms in cohesion without contact. They say that there is a power, either conscious or unconscious, which has endued the dead inert atoms

with the force of hardness and density inconceivable, with a force of repulsion in a certain sphere around them that defies all assault, and with attractive forces ever at work on others at certain distances, according to mathematical laws of refinement and complexity astounding to all thought. The amount of inert matter in an atom, which is a necessary condition of these amazing dynamical results, may be small beyond conception. The decimal, denoting the diameter of the atom in inches, may begin with a line of zeros from here to Sirius, or a thousand times as far. The power they talk of can put this inexhaustible energy into the atom whose dimensions are of any infinitesimal degree of smallness, having position and parts as near nothing as you please: there is nothing absurd in that. But if you reduce the minute locus to that which has position without parts, or to anything below their absolute minimum, they affirm, but they do not pretend to prove it, nor to show us at what point of discontinuity this happens, that the conception becomes absurd.

(70.) Boscovich is unassailable, so long as they have not demonstrated that there is no power in the universe which can make a fixed geometrical point into a centre of acting force. This they are not likely to accomplish, so long as their dynamical treatises are full of the conceptions of such centres.

They are compelled to think of the centre of their atom as a force-point without parts. The attractive forces of the earth and of the sun are invariably treated of by them as seated and working in the two pure force-points called their centres of gravity. They find nothing absurd in that conception. From the notion of a fixed mathematical point acting as a centre of force, the transition to its motion, *i.e.*, to a change in its position, is free from absurdity or ambiguity. We have only to conceive that the power, whatever it may be, which at the time t is found thus acting at the point P, should be found at the time t' acting at the point P′, having ceased to act at P; t' and P′ being as near to t and P, or as remote from them, as observations and sound logic may conclude. If there is absurdity in such conception, let it be proved, and let it be shown that the ancient mystery of continuous motion is increased by so conceiving.

(71.) The less learned of these writers or thinkers love to talk about inertia and the first law of motion. It appears to be a persuasion widely spread among them, that this is a demonstrated law, and they ask triumphantly, How can there be inertia in pure force-points without parts? Inertia is the attribute, not of nothing at all, but of a real, even if unknown, substance, such as matter. Thus they rest their

proof, that matter in the form of solid indivisible atoms is around them, on an appeal to motion, forgetting their own doctrine, that the matter of a body is the same in rest as in motion, and regardless of the fact that they can neither find it, nor show me how to find it.

The error of supposing the law of inertia, or helplessness of a body for changing its condition of rest or motion, as the first law of motion is called, to be a demonstrated truth of science, is fostered by the mistakes or the carelessness of writers like J. S. Mill, who, in Book ii. Chap. v. of his 'Logic,' says: 'Thus in mechanics, the first law of motion (the continuance of a movement once impressed, until stopped or slackened by some resisting force,) is true without qualification or error.' Few persons who read this, doubt that it is a demonstrated truth of science, that a body in motion, and perfectly free from external influence or resistance, must of necessity continue to move on with the same speed and in the same line. Mathematicians know better.

La Place ('Syst. du Monde,' p. 138) thus discourses on this presumed law:—'La nature de la force motrice étant inconnue, il est impossible de savoir *à priori* si cette force doit se conserver sans cesse. A la vérité, un corps étant incapable de se donner aucun mouvement, il paraît également incapable

d'altérer celui qu'il a reçu ; de sorte que la loi d'inertie est au moins la plus naturelle et la plus simple qu'on puisse imaginer. Elle est d'ailleurs confirmée par l'expérience : en effet, nous observons sur la terre que les mouvements se perpétuent plus longtemps à mesure que les obstacles qui s'y opposent viennent à diminuer ; ce qui nous porte à croire que sans les obstacles ils dureraient toujours.'

It is impossible to devise an experiment which shall rigorously prove or disprove the law of inertia, and if it were possible, nothing would follow from it about this matter ; nor could we find matter for ourselves by studying bodies in motion any better than while they are at rest. We can obtain evidence of the action of force *in loco*, but of nothing more.

(72.) Our friends A and B (17) thus discuss the subject before us :—

B. 'The mathematicians are against you ; mass is a factor of momentum.'

A. 'What is your symbol *m* but a number determined by experiment ? The mystery of the communication of motion is not cleared up by the invention of the word *matter*. I know, and can prove by experiment, as well as the materialist, the difference between a ball of four pounds weight and one of two ; and that what I call my ounce or my pound of will-force, which is my intelligible unit of all force,

will impart only half the velocity to the former which it imparts to the latter. I comprehend your mathematics of motion without troubling myself about your matter, and the wonderful eternal attributes of your atoms, so wise and clever that, as Sir John Herschel has so well remarked, they can solve in a trice a differential equation which, written, would girdle the globe.'

B. 'But the materialist would silence you, adducing the first law of motion; and he would demand your statement of that truth without the conception of matter.'

A. 'Yes, you seem to know those gentlemen. I never talked to one of them who did not take an early opportunity of showing his attainments about that first letter of the dynamical alphabet. This first law is a useful and necessary postulate; and, if the suppressed condition that all forces shall continue in unvarying action, be tacitly included in it, it is properly called an axiom. Our materialists appeal to it as to a demonstrated theorem. I grant you (what I suppose never was a fact in the universe), your body (say your atom) in motion, unopposed and unsolicited by any external forces. They say it must of necessity go on in the same line with the same velocity for ever. Suppose it is approaching

the point P: how do you prove by your first law of motion that the atom will not stop at P?'

B. 'The answer of course is, that such stoppage would be an effect without a cause: there are no forces acting on the atom.'

A. 'No external forces, by hypothesis; but how do you know that the internal forces may not determine it to stop at P?'

B. 'About the internal forces we have no supposition, nor can we institute any experiment. We can decide nothing about them but by reasoning which either makes the atom vanish to a point without parts, or takes for granted the axiom we have to prove. I am not inclined to fight the battle of the materialists against you; and in truth I enjoy as much as you do their funny logic. They are quite a match for the theologians for credulous unbelief and for guileless sophistry.'

A forgot to observe in his answer to the first remark quoted of B, that mass can be as well, and as clearly, defined by a number of molecules made up of a number of separate force-points having position but no parts, as, in the phrase of the matter-doctors, by a number of molecules made up of undefined and undefinable atoms.

(73.) In spite of all that can be objected, of the utter absence of definition and of means of verifica-

tion, to the dogmas of the materialists, they sing out their must-be, must-be, all the more loudly for their lack of arguments, both for their atoms, and for their bond between matter and force (67).

Against all that I place in the scale one little fact. I raise my arm ; What sent it up, and what keeps it there ? I can predict how long it shall remain up, and fulfil my prediction to a second. What keeps it there ? No display of learning about muscles and nerves will answer the question. Granting that my nerves in some way cause contraction in my muscles, I ask, What is it which sets the nerves in action ? What keeps it there ? Not force acting from matter upon matter, but force acting from my will, on what they call matter. I put the knob of my cane into the reader's hand. I push, you push ; we push in turns gently, we push hard. I can predict my pushes, so many in a minute, you can predict yours ; and we can fulfil our predictions, while neither can predict those of the other. This we can do before the eyes of the sages who affirm that 'I will' and 'I can' have no scientific meaning. The locus or compound body made up of arms and cane is the seat of new and varying forces, varying at our pleasure, beginning and ending at our free choice. Is that, so beginning and ceasing, so predicted and accomplished by us, is it all force acting from matter

upon matter, by the eternal invariable laws of their atoms? Is it not will against will, and from will upon will, in both initiation and duration of the force? Why is the cane thus moved? Because we will. When and how long? Just as we will, or as we suspend will-effort.

Compare their dogma with our little experiment. They will have it that no force can act, except from matter upon matter, by eternal unchanging laws. We exhibit to them the action of evident measurable force, which we can prove, by our accurate predictions of time and degree and duration, to be acting purely, through a familiar mechanism quite at our caprice, from will upon will. Is then my will matter? Is the reader's will matter?

(74.) To this they are compelled to answer; but they do not like it. From that bit of fact and logic they turn away, imploring fact and logic to 'take any shape but that.' They protest that all that has been debated and settled for ever, long ago. They are quite tired of that; but forced at last to feel ashamed of shouting 'must-be,' they betake themselves to their final and grandest display of tactics, in an assault on my citadel, my Will.

They assure me, in tones of persuasive kindness, that I am under a sad delusion about my will; that it never is a real cause of action, or of force; that it is

purely an emotion which accompanies my movements, all made under absolute compulsion of must-be. They tell me they have studied the forces of the Cosmos, and particularly those vital forces of protoplasm which generate what I fancy to be my free-will. They say, 'How could we understand the correlations of material forces with life and mind; how could we "discern in that matter" "the promise and the potency of every form and quality of life;" if we were not competent to deduce from it scientifically the quality in you, which you and we alike call your will? Your will, instead of being a cause of force, is a necessary effect and resultant of the forces which we find in action upon our atoms, and into which we have made profound researches. We know your will far better than you do; and our knowledge of it is entirely deduced from our science of the material forces acting in and upon you. You would know this also, if you had our learning; and you would be able to demonstrate your will up to the present moment, from matter and must-be, just as we can.' This is what they say to me with great perspicuity, and it is painful to have the rudeness to dispute their words.

But alas! I have not their learning; and I am a sad infidel about their living and feeling protoplasm. What can be done?

(75.) Let us hazard a supposition. If it be not too presumptuous, let us suppose that, after sitting long enough at the feet of those teachers, I came to know about myself and the Cosmos, the correlations of forces, and the genesis of my will, all that they know. In that case, I may venture to say, I should be able to write down my knowledge scientifically. Let me begin with an exact date.

As we have already satisfied ourselves, (41) the first proposition at the head of all my train of reasoned thought, about these acting forces, would be this affirmation of my active consciousness.—*When beginning this enquiry, I willed and I knew that I willed.* There is no other philosophical beginning about found or sought force. That we have completely settled. Out of that would logically follow the whole process of observation of the laws of the Cosmos, with deductions from the past, full of what these Evolutionists so comically call 'differentiation and integration,' concerning forces and generated will, a chain of proved genesis down to the exact date, ending triumphantly with the conclusion—Ergo, *At that date, when beginning this enquiry, I willed and I knew that I willed.*

The final proposition is thus identical with the first; it is that most laughable achievement in logic,—a circle.

CHAPTER VIII.

ON MAXIMA AND MINIMA.

(76.) To the question propounded in (43) Chap. V. we have not succeeded in obtaining an affirmative answer.

We cannot find what they call matter; while we easily find definite loci of force, called bodies, of varying shapes and sizes, and of all degrees of resistance, which we call hardness and softness. We can find these bodies both at rest and in motion. Some, the wall and the mantel-piece, for example, are immoveable by our utmost efforts, unaided by tools and mechanical appliances; others we know to be moveable; we can remember moving them and seeing them moved, and we can verify what we affirm, *e.g.*, by moving the chair or the table. And we know exactly what we mean when we talk of the velocity or momentum of a moving body, as well as of the time and space through which it has moved.

Here I imagine in the countenance of some of

my readers, an expression of incredulity and impatience: and I hear them ask—How can you pretend to talk of knowing or finding or conceiving the motion of a thing purely immaterial?

You affirm that the chair is merely an assemblage of separate points that are absolutely without parts; that it has consequently no material mass whatever; and still you affect to speak of its motion and momentum. In the same breath you maintain that something moveable is nothing moveable, and that nothing moved is something moved.

First, let me remark in reply, that the words material and immaterial have just as much meaning to my intellect as the words caterial and incaterial. I can admit into my philosophy no scientific proposition containing the word matter, or any of its derivatives, until I know—I do not say what matter is; (that may be too deep for me) but—how to find matter for myself. Nor do I think it reasonable in any man to manifest a feeling of annoyance or impatience at my declining the use of a word like matter, which stands for nothing found or conceivable by me.

Next, let me ask the reader to look candidly at the little sophism which is concealed in his use of the word *thing*. Allow me to state what I understand by *thing*. A thing is that which I know how

to find, and which I can show you how to find. That chair is something, in my use of the word, which I can easily find, moveable, moving, and moved; but nothing that I cannot find, moveable, moving, or moved, *i.e.*, nothing that I pretend to think or talk about. I confess that I do both think and speak of that chair as something moveable or moved, which I know how to find, meaning exactly thereby nothing whatever moveable or moved which I do not know how to find. When I affirm my knowledge that the chair has moved, from the position P to another, Q, I mean to say that the very same body or force-locus, the same exactly to all my means of measurement of size, mass, weight and resistance (which are very accurate means), that I found at the time t in the position P, was found by me at a subsequent time t' in the position P′, and I am confident that force alone has moved it. Am I hereby asserting that no thing found by me, or that some thing found by me, has changed its place? I cannot discover any sophism of reserve or ambiguity in my way of expressing myself; but there is sure to be sophism enough in the phrase of a disputant who at one moment puts 'thing' for that which he and I can easily find, and at the next moment for that which neither of us knows how to find, or to help another to find; without assumptions and must-be's,

and which neither of us can define or describe in terms intelligible to sceptical science.

(77.) I began my philosophy by declining all discussion of the question, What is? The *esse* or *essence* of a thing is beyond my faculties. I decline to affirm even the formula of Berkeley concerning either a thing or my idea of a thing, which is not me-the-thinker, that its *esse* is *percipi*. I can think and make propositions only about what I find. The *esse* I am quite sure that I am unable to handle, distinct from *esse percipio*, in the sense of *percipi percipio*; and this is a useless tautology, as *percipi* is *percipi* would be a useless identity, made with a useless abstract.

All this will be more or less unsatisfactory to the reader who has not laboured, in the school of self-denying scepticism, to wean himself from the habit of talking philosophy in words for which he cannot find a clearly distinguished meaning. To the man who has so trained himself, there will be not much science left in most of the refinements of metaphysicians, or in the boasting of the matter-and-must-be sages, who can discern in the matter of millions of ages ago 'the promise and the potency of every form and quality of life.'

We find around us a cosmos of bodies, that is, of measurable loci of measurable forces. These are

quantities, if I may employ that abstract in -ity, meaning thereby *found more or less.* It is very convenient for the clearing of enquiries about varying quantity to look for finite *maxima* and *minima.* Let us propose two clear questions. *Can we* find or affirm the existence of (28) *a maximum or a minimum finite force-locus?* I mean by finite that which is between zero and infinite. Let us begin with the finite minimum, by which I mean the least possible to be found separate, or by finite force to be made separate, in the Cosmos. Of a minimum force, which has no finite measure, and yet is not no force, I have not a clear notion, any more than of a minimum fraction which is not zero. But of a minimum locus, which has no finite measure and yet is not nowhere, I have a scientific conception, (48) as well as of a minimum involved in an expression of varying quantity.

I find that the force-loci around me are divisible, evidently to a degree of minuteness unspeakably beyond my power of observation; for example, a drop of water. The drop is made up of separable parts. Is there a finite least possible part, either in water or steam, of which the drop is a finite multiple? I am enquiring not about a minimum force, nor a minimum locus, but about a minimum force-locus. This is not a question about matter. I

am talking of nothing but found force in found locus, found by a thinker supposed to have competent faculties of observation and demonstration of the minute.

(78.) Granting what philosophers of all schools appear to believe, that a body is made up of molecules of which no two are in contact, and that the locus of a molecule is made up of smaller loci, separated from each other by intervals, it is certain that the extension of the smallest separate locus must either be a finite minimum having parts, or be a point having position and no parts. Of course there is no absolute minimum space-locus, except the non-finite mathematical point of geometry (48) having position but no finite measure, being infinitely small; but we are enquiring about an ultimate force-locus, the minimum possible component of the molecule, considered as a locus of acting force. Have we a meaning for the term 'absolute minimum force-locus' which is in its dimensions not the minimum space-locus? I will not venture to affirm that there is or that there is not an absurdity in the affirmation of such a finite minimum force-locus. If there is such a minimum, it must have parts in space, and it can only be a true minimum by virtue of its being a locus of force, of which minimum I can form no conception besides this—that no force in the universe can

make it occupy either a smaller space by compression, or a larger space by separation of its parts: for if it were compressible, the compressed form would be less than the absolute minimum, which is absurd; and if it were partitionable, the separate portions would be less than the same minimum, which is absurd.

Whether we attribute it to a conscious or to a blind unconscious cause, this force-atom can, I think, be thought of as an absolute minimum by us only by conceiving it to be perfectly indivisible, infrangible, and incompressible, a finite plenum of acting energy. Whether it be a minute mathematical line without breadth, or a mathematical plane or surface, closed or unclosed, without thickness, or whether it be a locus having solidity or volume, the conception of it, as a truly minimum force-locus, is expressible in no words that I can frame but these—that of an indivisible, infrangible, incompressible *plenissimum* of acting force, such that every mathematical point in it is at all moments a locus of energy, like every other, inseparable from the rest.

(79.) Here methinks I hear some reader observe that, after all my incredulity about matter, I have just been describing a material atom in the locus having solidity or volume. If the reader does say that, I am delighted with his evidence that the addition of what he calls matter to my conception of the facts

makes no difference; in other words, that matter is a term without any meaning or use in cosmology, and wanted only for cosmogony. But the matter-doctors are pretty unanimous in their doctrine that matter is not 'force,' but 'the condition of force.' How they found this out, or what is their defined notion of the condition, they never reveal to mortals. The distinguishing character of matter is generally stated as its *inertia, i.e.*, its utter helplessness and sluggishness when left to itself: whereupon they build their demonstration of the first law of motion. It puzzles me greatly to see how they discovered that it is 'the condition of force,' and the only condition ever alluded to, except the omnipotent *must-be*, in their teaching.

My rule against unproved assumptions in philosophy compels me to reject, with Boscovich, the definite minimum locus of force, whether it be matter in loco with force somehow seated thereon, or merely force in loco, *i.e.*, in loco other than the point without parts. For, however minute be the dimensions assigned or assumed for the minimum, the fair and obvious question still recurs—Why is there not, or why cannot there be, in the Cosmos a force-locus having dimensions a little less? Thus, to avoid unproved assumption, I am compelled to begin with the notion of the dynamical point without parts.

No other beginning of the philosophy of bodies is possible which does not set out with unproved assumptions of discontinuity and arbitrary magnitude.

(80.) Thus far we have enquired about a minimum force-locus, supposed to be the least possible as well as the least existing, without any stipulation that it shall be a locus of so-called matter as well as of force. Let me now ask the materialists, Is there a *smallest possible* portion of matter, called atom, either separately existing in space, or separable by finite force from a larger aggregate of matter? To this the most learned and logical of the assertors of matter cannot be brought to give a plain answer, whether they be Christian believers, or atheists of the extreme Epicurean Left. They know better than to debate that, although heaps of the less learned will preach about infinitely hard finite atoms. For example, Sir William Thompson, who is a believer in the Living God, the conscious Cause of All, in his address from the Presidential chair of the British Association, in 1871, thus speaks:

'The greatest achievement yet made in molecular theory of the properties of matter is the kinetic theory of gases, shadowed forth by Lucretius, definitely stated by Daniel Bernoulli, largely developed by Herapath, made a reality by Joule, and

worked out to its present advanced state by Clausius and Maxwell. Joule, from his dynamical equivalent of heat, and his experiments upon the heat produced by the condensation of gas, was able to estimate the average velocity of the *ultimate molecules or atoms composing it.* His estimate for hydrogen was 6225 feet per second at temperature 60° Fahr., and 6055 feet per second at the freezing point. Clausius took fully into account the impacts of molecules on one another, and the kinetic energy of *relative motions of the matter constituting an individual atom.*

'But there can be no permanent satisfaction to the mind in explaining heat, light, elasticity, diffusion, electricity, and magnetism, in gases, liquids, and solids, and describing precisely the relations of these different states of matter to one another by statistics of great numbers of atoms, *when the properties of the atom itself are simply assumed.* When the theory of which we have the first instalment in Clausius and Maxwell's work is complete, we are but brought face to face with a superlatively grand question, *What is the inner mechanism of the atom?*

'In the answer to this question we must find the explanation not only of *the atomic elasticity by which the atom is a chronometric vibrator, according to Stokes's discovery*, but of chemical affinity and of the

differences of quality of different chemical elements, *at present a mere mystery in science.* Helmholtz's exquisite theory of vortex-motion in an incompressible frictionless liquid has been suggested as a finger-post, pointing a way which may possibly lead to a full understanding of the properties of atoms, carrying out the grand conceptions of Lucretius, who "admits no subtle ethers, no variety of elements, into fiery, or watery, or light, or heavy principles; nor supposes light to be one thing, fire another, electricity a fluid, magnetism a vital principle, but *treats all phenomena as mere properties or accidents of simple matter.*" This statement I take from an admirable paper on the atomic theory of Lucretius, which appeared in the "North British Review" for March 1868, containing a most interesting and instructive summary of ancient and modern doctrine regarding atoms. Allow me to read from that article one other short passage finely describing *the present aspect of atomic theory*:—"*The existence of the chemical atom, already quite a complex little world, seems very probable;* and the description of the Lucretian atom is *wonderfully* applicable to it. We are *not wholly without hope* that the real weight of each such atom may some day be known—not merely the relative weight of the several atoms, but the number in a given volume of any material;

that the form and motion of the parts of each atom and the distances by which they are separated may be calculated; that the motions by which they produce heat, electricity, and light may be illustrated by exact geometrical diagrams; and that the fundamental properties of *the intermediate and possibly constituent medium may be arrived at.* Then the motion of the planets and music of the spheres will be neglected for a while in admiration of the maze in which the tiny atoms run."

'Even before this was written some of the anticipated results had been partially attained. Loschmidt, in Vienna, had shown, and not much later Stoney independently in England showed, how to deduce from Clausius and Maxwell's kinetic theory of gases *a superior limit to the number of atoms in a given measurable space.* I was unfortunately quite unaware of what Loschmidt and Stoney had done when I made a similar estimate on the same foundation, and communicated it to "Nature" in an article "On the Size of Atoms." But questions of personal priority, however interesting they may be to the persons concerned, sink into insignificance in the prospect of any gain of deeper insight into the secrets of nature. The triple coincidence of independent reasoning in this case is valuable as confirmation of a conclusion violently contravening ideas and

opinions which had been almost universally held regarding *the dimensions of the molecular structure of matter.* Chemists and other naturalists had been in the habit of *evading questions as to the hardness or indivisibility of atoms,* by virtually assuming them to be infinitely small and infinitely numerous.

'We must now no longer look upon the atom, with Boscovich, as a mystic point endowed with inertia and the attribute of attracting or repelling other such centres, with forces depending upon the intervening distances (a supposition only tolerated with the tacit assumption that the inertia and attraction of each atom is infinitely small, and the number of atoms infinitely great), nor can we agree with those who have attributed to the atom occupation of space with infinite hardness and strength (*incredible in any finite body*); but we must realize it as a piece of matter of measurable dimensions, with shape, motion, and laws of action, intelligible subjects of scientific investigation.'

(81.) From this extract from Sir W. Thompson's address, in which the italics are my own, we obtain no clue to an answer to our enquiry about the minimum material atom; but it is valuable as evidence, given by one of our most gifted philosophers, of the 'present aspect of atomic theory.' The aspect is not very hopeful, after all the cheerful

words of the distinguished President. He records something that has been taught wrong, and something very vague, which philosophers have endeavoured to teach right.

We have advanced so far at least as to the report of a suggestion of a finger-post, inscribed 'may possibly lead.' We learn what we *must* no longer think, and what we *must* now realize in a piece of matter—viz., that it is matter measurable in its measurable dimensions; but, as to what it is in its dimensions out of our reach, we infer that we ought to be thankful that we know how to spell *matter*.

I shall never forget the wrench which I got in my head on first reading this account of atoms. I felt the weight of what seemed the decision of that illustrious chair, that I must content myself with putting off for another century or two all attempt to frame those first conceptions about matter, on which, in philosophy without assumptions, everything depends.

(82.) Most persons imagine atoms to be the ultimate components of molecules: but Professor Thompson ignores, or rather rejects, the distinction between the two. He will have nothing to say about minima; nor indeed was he called upon to discuss that notion. His molecules and atoms are the same thing, and are evidently all alike complex

little worlds, which have an 'inner mechanism,' and 'relative motion of the matter constituting' them: they are individual, but not undivided atoms; they are much divided indivisibles; and this apparently without exception. I must, however, beg leave to continue to speak of atoms as minima, which are the least parts of which molecules consist. I confess myself at a loss to see how the *permanent satisfaction* to the scientific mind, which is wanting so long as the *properties of the atom* (*i.e. molecule*) *itself are simply assumed*, can arise from the most successful discussion of the *inner mechanism and of the form and motion of the parts of each atom* (molecule), so long as the *properties of those parts themselves* are simply *assumed*. The question of the minimum which Sir W. Thompson studiously, and perhaps on that occasion properly, evaded, will force itself on the thinker, after all, in the necessary attempt to define the parts of the complex molecule, whether a chemical or dynamical little world. No possible analysis of a molecule into finite parts *assumed*, would yield the satisfaction so justly demanded by Sir W. Thompson. Every assertor of matter is compelled to believe at least that there are atoms of the minutest existing magnitude. I presume that Sir W. Thompson, if human observation could decide the question, would expect to find such among the constituent parts of

his complex molecules—say of hydrogen, or of what is called the ether of light.

(83.) There is assuredly a class of minutest bodies, which are true existing minima, the very least in all the Cosmos which are not in abiding contact with other small bodies, but actually separated from others by boundaries in space. That is, there are bodies asserted by materialists, which none of the forces brought to bear on them in the Cosmos ever break up or dissolve into smaller portions. I think that there is so evident an absurdity in denying this to be their assertion, that I need not dwell on it. If there is no existing finite least, Boscovich wins of course, by logical necessity, and matter is literally nowhere. But it is another thing to affirm that there are *absolutely* minimum bodies, atoms in the true sense, which no finite force whatever can reduce by compression, solution, or fracture. The least existing in the Cosmos as it is, and the least possible under any conditions of acting force, are not the same thing. Nor is it justifiable to attribute to all the assertors of matter, that they affirm any finite existing minimum force-locus to be absolutely the least possible in the nature of things.

(84.) Yet I do not see how the materialist who believes matter to be real, eternal, and uncaused, and to be the necessary condition of all force, can consis-

tently shrink from such affirmation. He may indeed remark, that no man, in denying zero to be a number, is thereby committed to the assertion that there is an absolutely minimum vulgar fraction having value. The remark is true concerning abstract quantity; bnt we are talking of something concrete, solid and composite, in time and space and action. You insist upon it, that the point without force cannot possibly be a force-locus, because matter is the necessary condition of force, and in such a point there is no room at all for space-filling matter. Can you deny that there is by the law and bond of matter and force, as you conceive it, some least locus of space-filling matter, the seat of force, which is, if not a minimum actually existing in the Cosmos, absolutely the least that can exist in the nature of things, and verily the nearest possible to the point without parts? That is—verily nonsense?

The materialist will naturally say something funny about metaphysics, and march away with 'Common sense' to 'Must-be.' I will urge no farther this difficulty of the absolute minimum. Boscovich avoids it by clearly stating his unambiguous beginning in his dynamical point. I merely observe that if the finite absolute minimum is affirmed, it can be demonstrated, as in (78), that it is infinitely hard,

strong and incompressible, and as Sir W. Thompson justly remarks in the above extract, 'incredible.'

(85.) Let me be permitted to remark that my impression about the molecules of Boscovich is different from that of Sir W. Thompson above quoted. Why should it be assumed that the number either of them or of their component force-points is infinitely great in a given space? May we not say, that a possible plane molecule in some simple element, perhaps simpler than hydrogen, might without evident absurdity be imagined to be four pure force-points, A B C D, forming a square of infinitesimal dimensions, the sides of the square being very near to a distance of cohesion? The system might be in repose and equilibrium, the opposite pairs A C and B D equally attracting each other. If by some sudden force A and C were compelled to approach to a distance from each other considerably less than the side of the square, their mutual repulsion would set up a vibration that would, I suppose, continue for ever till checked by force, the points A and C receding and again approaching in the line A C, and the points B and D doing the same in the line B D. One can conceive a sort of gas made of such nimble molecules, without affirming an infinite number of them in a finite space. They must of course be

separated from each other by distances of repulsion, to form a gas, and they might have rotations. But how to get the force located and working in those position-changing points without parts? Ah! that is a question! Solved for a single molecule, it is solved for ever for the wondrous All! Is it really easier to get it there by imagining the points to be the centres of gravity of so many atoms of inert stuff called matter, which is not force, nor anything that we can either find or conceive? Does one answer require more faith than the other? The answer of the materialist is certainly the more decorated. There is more of fancy-stuff in it. But the mystery of force, to say nothing of the more awful mystery of life, remains unsolved by the six letters.

(86.) I have more than once been instructed by believers in matter that the controversy is at an end, because the scients have obtained demonstration 'On the Size of the Atoms,' Sir W. Thompson having communicated the discovery to 'Nature.' Sir W. Thompson informs us truly, that he has deduced from a certain speculation a superior limit to the number of—not atoms, but—molecules in a given measurable space; not atoms, but complex little worlds presumed to consist of an unknown number of atoms; which, for anything that has been shown or reasonably guessed to the contrary, may be the

force-points without parts of Boscovich. One thing is certain, that if there be no absolute minimum atom m of matter whose diminution is impossible by finite force in finite time, not all the powers of Nonsense and Must-be combined can shift the dynamical starting place from the point of Boscovich which has changing position but no parts, a point in which, and in any number of which, there is no room at all for the space-filling stuff called matter. For of every assignable or conceivable smallest m it will be false to say, 'This is no aggregate of parts held together by finite force;' it will be true to say, 'm is separable by force into parts less than m;' and we should be compelled thus, in our search for the minimum locus of force, to reject every m having separable parts, and to take for starting-point in our conception of the aggregate of indivisibles which we call a body, the force-point of Boscovich, thus pitching all matter away.

Let it be observed that this question—Is there an asserted minimum?—is not the silly old question, Is matter infinitely divisible?

Nor can the assertors of ultimate material atoms ever reason about the behaviour of such atoms to each other, without having recourse to what is wonderfully like the force-points without parts of Boscovich. They will be compelled, if ever they

frame a molecular or atomic dynamical science, to deal with their atoms in all their equations of motion, as they deal with the sun and the planets; they will have to think and to speak of them as if the whole mass of every atom having parts was collected in the point without parts called its centre of gravity.

(87.) We see no difficulty or apparent absurdity in thinking of a force-point as of a centre of repulsive force, due to some competent cause or power, in all directions, repulsion through which nothing can break, a force changing from infinite at the point to finite and zero at increasing distances from it, and through zero passing into attraction for further distances. But it is not easy to conceive the minimum material atom, whose parts—for it has parts, though inseparable by any force—are this inert and sluggish matter, bound together by cohesion of infinite, or at least hypercosmic power, parts I suppose of quasi-infinite density, and having a surface, a mathematical or differential surface, which is in its inward side the seat of that enormous attraction to the rest of the inconceivably hard atom, while on its outward side it is the seat of a like unconquerable repulsion to all that is near, on the usual hypothesis that no two atoms can be forced into contact. It is not easy, I say, to imagine the energy acting in the surface of the absolutely minimum atom

thus to change sign at infinite, under the puzzling conditions of force decreasing on the outside but not on the inside of the surface. I do not say that there is absurdity in such an attempted conception, but it is to most minds incredible, and far less simple than the notion of Boscovich about his force-points without parts; besides, it is every word of it unproved assumption.

(88.) We hear perpetually that the matter of the Cosmos is distributed into atoms and ether. The ether is moveable and partitionable, and must be made up like any other fluid of minimum particles. What is the difference between the atoms proper and these particles we cannot learn.

It is a useful meditation to hold a child's india-rubber ball, now expanded in the open hand, now crushed in the closed hand, then suffered to recover its spherical form, then allowed to fall, then stopped by the hand in its fall after rebound. It is useful, I say, to study along with the unvarying matter the various manifestations of force in hand and ball, about which we can be under no mistake, because we can repeat the observations as often as we please; and to ponder the two theorems of our matter-and-must-be professors, that force is the eternal property and attribute of matter, and that matter is the condition of force, trying to find out, as they must have

found out, where and what this matter is which explains it all. A good doubter will soon convince himself that the mystery of the 'force motrice' of which Laplace speaks (71) is only darkened by the invention of inert space-filling matter; however satisfactory to ignorance and credulity the term may be, for the answering of questions about conditions and cause. But it is pleasant, after all, to have such refuges of discomfited thought and 'common-sense' as—must be matter, and—matter must be.

(89.) Let me now state the three scientific reasons for which the current dogmas about the stuff called matter appear unworthy of my acceptance. The first is, that I cannot find this matter for myself, nor can its assertors give me any description or definition of it (as distinct from found force, acting in found place), which they can show me how to verify by any experiment. The second is, that the constant and necessary bond which they affirm between matter and force is a direct contradiction to the perpetual witness of my active consciousness, whereby I know that my free-will originates and maintains at my choice and pleasure manifestations of force. The third is, that in the affirmation of a definite minimum locus of force, in which they are unanimous, there is an assumption of discontinuity and magnitude unproved and unprovable. Any one of these reasons

would compel me to reject the whole conception of this matter from a philosophy without assumptions. If we add to this, that our scients can state nothing about the Cosmos, which they either definitely know, or definitely ask to know, in terms of their molecules or atoms, which cannot be clearly and scientifically stated in terms of the force-points without parts of Boscovich, we may be pardoned if, as good doubters, we favour the opinion that matter, space-filling stuff which is not force, is, like must-be, a term too many, and an instrument of sophism; that matter, like must-be, is a symbol not of thought, but of want of thought; and that matter, like must-be, is a venerable rag of Ignorance.

(90.) It has become quite a commonplace of philosophical remark among some of our matter-doctors, that matter is a substance known only by its properties.

The sages who affirm this are of far profounder penetration than the vulgar herd who can feel matter directly with their fingers, and see it with their eyes; because they go deeper into logical inference. We knew better than the crowd, say they; it is a mistake to fancy that you can get at matter *per se*; we confess that it is cognizable only indirectly, by its properties. In this confession everything which I affirm appears to me to be conceded.

These thinkers find in time and space certain facts of force and motion, which they can accurately describe and measure, and which they can show me how to find.

They tell me that these facts, when labelled with abstracts with learned tails, are properties of matter; that by these properties they know matter, and that with such intimate acquaintance, that they can 'prolong the vision beyond the limit of the experimental evidence, and discern in that matter the promise and the potency of every form and quality of life.' It is very wonderful; it takes away one's breath! But how am I to obtain from them, I do not say, this discernment of the promising future of matter myriads of millenniums ago, but the privilege of acquaintance with matter to-day? They assure me that I may know it by its properties. But everyone has not their gift of discerning. How am I to be sure that I know this, till I know what I presume they have found out, that there is in the Cosmos this space-filling substance called matter; that matter has for its properties these facts, which, like them, I find; and that nothing else but matter can possess these properties? Here are three things which a sceptic like me requires to know with demonstration, before he can admit into a philosophy without assumptions, that so and so are the properties of

matter, and before he can pretend to share with the more learned *their actual knowledge of matter by its properties.*

(91.) We have heard of dignitaries in science before these days who were known only by their properties. For example, Phlogiston used to be so known by the greatest of philosophers. What is become of the substance of that gentleman, once quite familiar and learnedly recognized by his properties? Where are the vortices, and the epicycles? Where is the solid firmament? These were long known only by their properties. Was there ever a supposed reality *sui generis* of time and space known to science only by its properties, which did not turn out to be moonshine and metaphysics?

(92.) Such general remarks after all go for little. Let us try honestly to find this matter by its properties.

Ice, water, and invisible steam have contrary properties; yet it is maintained that a pound of ice, in a kettle on the fire, is identically the matter of the water and of the steam which presently take its place. The unchanging matter cannot be known by these contrary, changing, and vanishing properties; but, because it is unchanging, it must be presumed to have unchanging properties. I beg an introduction to these invariable properties, that I may have

a chance of knowing the matter thereby. To this it will be replied that, of course, the sensible and contrary properties, by which ice, water, and steam differ, are due, not to the matter in itself, but to the mode of its aggregation; but that there is nothing to prevent my studying the matter itself in all the three states, except mechanical and optical difficulties. Am I so unreasonable as to expect the matter-doctors to show me the ultimate atoms? Do I pretend that my inability to see them is any evidence that they are not present? I do not pretend it. I grant at once the divisibility of water to an extent inconceivably far beyond the reach of human eyes and instruments, even into parts as small as the minimum locus which they call the smallest atom.

(93.) Let us suppose that I and my opponent were by some power endued with senses and instruments fine enough to enable us to find and measure for ourselves the atoms in the molecules of steam or of hydrogen. There is no evident absurdity that I can see in the supposition. The atoms are thus actually in our ken and grasp. I desire to learn to know matter in its simple form by its properties. What are they? We can find them only in the properties of the atoms; and as one atom is a fair sample and type of all the matter in the Cosmos, it

ought to suffice for the knowledge of the matter itself, as distinct from the results of aggregation and force impressed from without, to study a single atom. What is to be learnt? First, I am told, that the atom is unapproachable at the closest quarters; that it is impossible for me or for any other really to touch it by any instrument, or to break through the sphere of repulsion which environs it. That is clear and valuable information about the force, but hardly about the matter itself. I get no better conception of the repulsion or of its cause in my vain attempt to come at the atom of supposed matter, than I should have if I were attacking a like sphere of repulsion about a point having position without parts. And I would ask the reader, whether his conception of the unapproachableness and of a good reason for it, is really made easier by imagining an infinitesimal atom of unknown inert stuff at the centre of the repelling sphere?

(94.) Another attribute, they tell me, is its indivisibility, infinite cohesion, and hardness (84, 86). All larger aggregates are separable and divisible. This atom is absolutely indivisible, otherwise it could not be the absolute minimum. I am to try to know matter in its simplest form before me from this property. But how am I to get at the knowledge of the property? How much force am I to employ in

my attempts to smash the atom, before I have the certain assurance that no force can break it? If I had at my command an impact equal to the collision of two worlds, how could I know, after trying it again and again, that a hundred times that momentum would not fracture the atom? For proof of the negative I must have the command of an infinite force. What then becomes of our fine theorem that matter is to be known only by its properties? It turns out oddly enough that this property is known only by the matter (78), and is in itself unverifiable and unknowable.

(95.) Another property of this atom is eternity. At least eternity is a sort of square property of the atom, according to the scientific ideas of the Westminster Reviewer of January 1875, who in his notice of J. S. Mill's 'Three Essays on Religion,' which by its blaze of light makes poor Mill almost invisible, thus writes: 'Even assuming with the assertor of free-will that volitions are uncaused, the properties of matter, as far as experience informs us, are uncaused also, and have one great advantage which no particular volition can show; they are to all appearance eternal.' This gentleman disdains the poor praise or ambition of the 'Felix qui potuit rerum cognoscere causas.' 'Felicior dignoscere res potui sine causis,' is his line of glory. His little

error about the notions of the assertors of free-will is a trifle, and cannot mislead the reader of our coming chapter on Will.

The important discovery before us is that eternity to all appearance is the property of every property of matter. It is a property square of matter. A property of matter is one of the square roots of eternity. 'To all appearance' is superfluous. The speaker is talking of phenomena, appearances. The properties of matter are appearances to all appearance eternal; they are phenomena all-phenomenally eternal. I cannot see how this differs from the enunciation of the discovery that the properties of matter are eternal. Whence this investigator got his facts and his scale of measurement, we are not yet informed. Of course from 'must-be.' I give up at once the task of verification of this position in the science of the finite, that eternity is one of the properties of the unapproachable bit of so-called matter before us.

This deliverance of the Reviewer is a fair sample of the sublimities of matter-and-must-be learning. The properties of matter have had the honour of presentation to his intellect. That has conferred upon them at once the property of all-phenomenal eternity!

It would be a small addition to my knowledge

in my vain attempts to get at and to fracture the obstinate atom, if a Westminster Reviewer were to come up and ask—Do you know what is inside that little body? My ignorance would answer, How can I, when I cannot get at either the inside or outside of it? Ah! that is the difference between you and me; I do happen to know. It is matter, of whose eternity and other infinite uncaused properties great Must-be has made me master! It appears then that the discovery of matter inside atoms, if I could examine them, would be not a whit easier than I find it now in chalk and cheese—in ice, water, and invisible steam.

(96.) Did I say too little for matter (65), when I declared my ignorance of all arguments of the matter-and-must-be doctors, beyond everlasting must-be's, defended by circles and sophisms? All their logic comes to this—It must be matter, because it has the properties of matter; and it must have the properties of matter, because it is matter. So we prove Church by Holy Scripture, and Scripture by Holy Church. When will circular logic be out of fashion?

After informing me that matter can be known only by its properties, the only properties which they show me how to find and measure are precisely the forces which Boscovich, while denying matter, de-

scribes to them, in pointing out the various force-loci of the Cosmos around us. And when I ask them how they discover that these properties prove their matter,—they answer, must be so! we know! Then when I have extracted from them their simplest unconfused conception of matter, in the wonderful shower of indivisible atoms in the chaos of Lucretius, they tell me of infinite properties inconceivable and unverifiable, which, instead of proving their matter, have to be proved by their matter! And the only answer to my question how? and why?—is, must be so! we know! The fundamental theorems of these doctors about the finite are propositions containing the infinite. Such propositions are all always instruments of sophism.

(97.) When I presume to say this, they drag me with them to their Ebenezer, and make me sit under their most eloquent preacher. There the spell of rhetorical genius takes away all my wonder at the smallness of the demand for logic in that congregation. The gentleman in the pulpit was a master both of painting and prophecy.

'As sure as every future grows out of past and present, so will the physiology of the future gradually extend the realm of matter and law, until it is coextensive with knowledge, with feeling, and with action. The consciousness of this great truth weighs like a

nightmare, I believe, on many of the best minds of the day.

'They watch what they conceive to be the progress of materialism in such fear and powerless anger, as a savage feels when, during an eclipse, the great shadow creeps over the face of the sun. The advancing tide of matter threatens to drown their souls; the tightening grasp of law impedes their freedom; they are alarmed lest man's moral nature should be debased by the increase of his wisdom' (Lay Sermons of Prof. Huxley, p. 142, 3rd Edition).

I quite understood the phrase 'matter and law;' it meant simply 'matter and must-be.' The preacher knew a good deal empirically about the order of discontinuous sequences in the Cosmos; but of any scientific expression of law proper, whose continuous action he could predict from point to point and from moment to moment, except the law of gravitation, he had just as much demonstrated knowledge as the stool he stood upon.

The orator amused me a little by mistaking a plain fact, inevitable by the celestial mechanics of sectarianism, for a very fine figure of his own invention. The eclipse is creeping on, sure enough, said I. But as I knew that eclipses creep off as well as creep on, I did not feel quite the fear and anger of the savage. When the preaching was done, I stuck

to my disagreeable arguments and unanswered logical demands with the same tone of the irreverent sceptic that I am. The end of it was, that they all went off, sinners and saints together, into their wood, and there groaned their prayer to Must-be. O Must-be! hear us! O Alma Venus of our Lucretian mysteries! Great Spinner of our Logic and mother of our Gods, O Must-be, hear us! And they leapt and kicked upon the altar which they had made, and cut their shins in vain.

(98.) Some of our matter philosophers adopt a tone at once of profundity and conciliation. We hear that the underlying substance of mind and that of matter may be at the bottom the same. That is very, very deep! We hear that the phenomena of matter may be expounded as phenomena of mind, and *vice versâ*, that the phenomena of mind may be expounded as phenomena of matter. That sounds like a thorough mastery of the subject. Quite recently it has been brought within the reach of all us homely folk, by an oracle in the 'Contemporary Review,' of marvellous fluency and tone, which lays it down that mind and matter are 'made of the same stuff.' Would these writers kindly favour us with their thoughts, instead of with a dish of tropes and stuff and quarrelling words? Are mind and matter the same, defined and found to be identical?

If not, these pundits have the great advantage of being enigmatical. But playing at Sphinx is not talking science.

To one and all of them I sadly and seriously say, —If you have a confession of faith and adoration to make, make it like an humble and an honest man; but come not hither pretending to us ignorant people that you have a scientific key to chambers which science can neither shut nor open.

The topic *maxima* will be handled in the following chapter.

CHAPTER IX.

THE MAXIMUM BRAIN AND MR. MATTHEW ARNOLD.

(99.) We have not succeeded in finding a finite minimum force-locus, whether of matter the seat of acting force, or of force in loco without a seat. To the first of our two questions in (80) no definite answer is given, but in must-be and unproved assumption. On the correct answer to the second question—Can we find or infer that there is a finite maximum locus of force?—there is no difference of opinion that calls for notice. The materialists never assert that there is a limit to the extent of their Cosmos of matter and force. Such affirmation would be reduced to absurdity by the well-known argument which is employed to disprove the assertion of a limit to space. Yet if any of our philosophers took the fancy of setting up the dogma of a limited Cosmos of force, he would have little difficulty in making adherents among the cultivators of matter-and-must-be logic. Let the reader imagine

himself in debate with such a philosopher, and showing him the nonsense of his dogma by supposing, which is quite fair, that he was close to the affirmed limit and struck it with his stick, proceeding with the usual argument. The opponent would put him to the rout by a single word. He would merely have to cry out, knobstickomorphism! or bacteriomorphism!—whereupon all the admiring crowd would be enchanted with the grand new term; they would see at once the crushing confutation in it, and would clap their hands with the triumph of philosophers.

This does seem a little too bad; but it may stand for a fair account of the cant that we hear on all hands from shallow thinkers about that much admired discovery of Atheism, anthropomorphism. On this we may spend a few words, before we quit our topic of maxima and minima, retaining the supposition, not yet proved, that I have an audience of conscious thinkers like myself.

(100.) There is no more amusing dogma than that perpetually affirmed by gentlemen of the atheistic persuasion that there is somewhere a maximum finite brain, a finite intelligence, the highest in the universe—or else a round table of them, all equal. They mock at me as a man-magnifier, and charge me with anthropomorphism, when I confess my

faith in God, the Infinite Mind and Will. Yet they expect me to admire vastly their more correct anthropomorphism, just up to a finite limit. But which is most like a magnified man, the spiritual object of my faith and worship, without parts or passions, or their asserted biggest Biologist, and most prodigious Protoplastologist? It is the craftsmen of atheism, not we, who are the grovelling and self-magnifying anthropomorphists. Do they deny that they affirm this highest finite intelligence above which there is absolutely none in being? I will compel them to confess it.

They allow, that there are minds of very different powers; nor do I believe that there are two dogmatists among them who fancy themselves to be the crown and summit of existing intelligence and personality. They deny also that there is an Infinite Mind; wherefore it must follow, and it does follow even to them, that there is somewhere either one supreme finite intelligence, absolutely above all, or else a round table of them, all of equal brain-power, unsurpassed in all existence. It is not disrespectful to them to suppose that the abode of that exalted tip-topmost Philosopher in the Cosmos should come to be known by them, still less that he should learn in his far-off star enough of the fame, say of Dr. Must-be-so, to induce him to visit the latter

as a friend and a brother. Nor can the reader be offended if I imagine him to be introduced by the doctor to the Pamprotoprotistoplastologist of the universe. I think I know what the reader would say to that sublime personage if he got him aside for a moment. 'I do not believe, nor do I think you believe, what Dr. Must-be-so tells me. He says that he knows, and that you know, that you are the most powerful thinker and the wisest scient existing in all the realm of consciousness.' What would be the reply? What but this?—'Does he say that?—then I advise you to get your friend the doctor with all speed into safe custody.'

(101.) That there is such a marvellous finite scient, or a whole college of them, actually existing somewhere in the Cosmos, is a most undoubted dogma of the atheists, from morn till eve, wherever they be. It is the clearest and sublimest of all their verities; a verity of fact, of thought, of mind. What truth can they write down that can be compared with it in all-subduing biological and psychological majesty? My business with this dogma is to ask whether it is admissible as a proposition in Philosophy without Assumptions. It is one thing to affirm that this finite mind, the highest intellect in the universe, exists, and another to affirm that his personality and supremacy are known either to others or to himself.

The first is affirmed as scientifically certain by every atheist; it is not fair to charge them all with asserting or believing the second. How is it possible for any investigator to say, I can prove the truth that a certain known finite philosopher A is the loftiest intelligence existing? Whether A or some other be the speaker, the affirmation is demonstrably that of a madman; because no finite rational being could pretend to have compared and measured, even with approximate accuracy, all the intellects in all the worlds: for such a pretence would affirm the impossible thing, that he had actually explored all the infinitude of space, counted all the worlds, and completed by such exploration the demonstration that there are no more worlds. None the less does the first remain as the sublimest discovery and grandest fundamental theorem of all atheism. It is a theorem about the finite, free from ambiguity of every kind, the certainty of which it is the glory of atheists to have mastered, and to affirm with fanaticism inexpugnable. Well—it is a definite theorem in the science of the finite, which has this remarkable character, that while it is merely pretended by ignorance that it is folly and superstition to deny or doubt its truth, it is proved by reason to be sheer madness to suppose it to be either verified or verifi-

able, even approximately, by any intellect in the Cosmos.

There is, says the dogmatic atheist in his self-bloating anthropomorphism—there is, at this moment, either in this planet, or in some other habitable orb, living and thinking with finite wits and personality like mine, the very highest intelligence and will in the universe. This is a fundamental truth of scientific atheism, about time and place and person, of which it is demonstrably the wildest absurdity to think that actual proof of it, or even probable evidence in testifying fact, can possibly be presented under any condition, at any moment, in any place, to any thinker or person in existence. And this is what they call philosophy! Philosophy profoundly sublime! I dare say it does them good somehow.

(102.) This absurdity cannot be charged on the believers in an Omniscient God and Father of all; for to Him nothing is unknown, and He can communicate to His servants what from Science they could not learn. Nor is it a reply to say that it is no reproach to a thinker, to affirm that there is somewhere a biggest sun or planet, even though it be absurd to maintain that its whereabouts and supremacy in size are verified or verifiable to a finite observer. For a limited magnitude in space is part of the definition of sun or planet, and nothing can be

posited as definable in terms of time and space which is not limited; while will and consciousness are not definable in terms of time and space, nor are the degrees, limits, and measures of intellect and thought which are matters of experience so definable. The assertion of a finite minimum or maximum in 'I am,' 'I will,' 'I can,' requires to be proved. Limits in time and space supply no proof.

I do not charge with this absurdity those deep Sagacities who refuse either to affirm or to deny the Being of an Infinite Conscious Cause of the universe. Every thinker on this topic has at least the personal right to say, I decline to pronounce a judgment. By all means. But why put on that air of judgment?

Nor do I pretend to have quite convicted the professed atheist of a logical absurdity. There is a monstrous incongruity only in his creed, entirely foreign to all established truth about the finite. He believes in an existing intellectual king of the universe, who cannot be known or found, although at this moment the most eminent of its philosophers, and who can never know that the crown is on his head. But we are not all merely cold logicians. The logical reasons for doubting his finite majesty's personality are trifling in comparison with the moral disgust which even atheists would feel, at hearing some terrestrial or celestial Matthew Arnold claim the

decoration, or with the burst of wrath with which every non-lunatic among men or angels would spurn the insult of the seriously offered diadem.

(103.) I have used strong language in return for the scornful cant of dogmatic atheists about anthropomorphism. I am bound to justify it. Mr. Matthew Arnold, in the 'Contemporary Review' for October 1874, writes thus: 'In general, as God is said to have formed man in his image, in the image of God, man has returned the compliment, inwardly or outwardly, and has made God in the image of man.' There we have in all its glee and coarseness the vulgar atheistic charge of anthropomorphism, and the reader can judge whether it be a fair account of his faith and mine. The writer continues:—'So, we construct a magnified non-natural man, by dropping out all that in man seems a source of weakness, and inserting the contrary.' 'Then between this magnified man and ourselves we put, if we please, angels or men etherialised. The objection to the magnified man and to men etherialised is one and the same. We absolutely have no experience whatever of the one or of the other.'

Observe, first, that the logic here used is equally valid against both the conceptions and the names of zero and infinite; for of pure nothing, as well as of actual infinitude, we have absolutely no experience

whatever. If, when the reader denies the possibility of a maximum finite number of feet, or of a maximum finite volume of space, and thus affirms the infinite, Mr. M. Arnold should have the modest assurance to tell him that he is merely constructing a magnified human stature, or a bloated human skin, he would probably remark that the speaker was stating for a truth what is a flat untruth. But that untruth is quite as true as the charge which Mr. Arnold chooses to bring against me, that I worship a magnified man, when I adore the living, working, knowing, loving God. He piques himself on his sagacity, in discovering that there is no conscious I AM upholding and ruling this ALL, in deriding the belief in Him, and in knowing what he means by 'the Eternal Power not ourselves' that 'loveth righteousness,' and 'that makes for righteousness.' Of course he will not be held to more than a mocking rhetorical 'loveth,' nor probably to any definite sense of the word 'Power.'

(104.) Let us turn over cautiously what our prophet teaches. 'The objection to the magnified man and to the man etherialised is one and the same. We have absolutely no experience whatever of the one or of the other.'

So long as we have verifying experience in time and place on our side, we may form our notions of intellect and will in the Cosmos, or speak of other

people's notions, without rebuke; but if we talk or think of existing or possible intelligences, one or many, the like of which is not within the range of our experience, we do a thing objectionable. The objection is without reserve against the supposition of any mind or will or conscious power in existence above the highest among ourselves.

Mr. Matthew Arnold would probably grant that there has been mental progress in humanity. We might respectfully ask him this question: 'Suppose a Matthew of four thousand years ago, distinguished like you above all his generation for sweetness and light, for learning and modesty. Suppose that by the process of Matthewmorphism he had worked himself up to a belief that there was somewhere, either in this planet or in some brighter world, an intellect far more noble and etherial than himself, in short, such a Matthew as you here before us. If we came to know what that ancient thinker thought and believed, should we have a right to say that he did a thing objectionable?' Of course he would reply, 'Certainly not; because we cannot affirm that the Matthew here present is beyond our experience.'

We might further seek light at the fountain thus: 'Suppose that we, having formed a duly exalted idea of what you are at this moment, should magnify that into a belief that there may somewhere in the

universe be a Matthew a little more etherial in sweetness and light, and perhaps a few thousand times as profound in literature and dogma. Would that be a thing objectionable?'

'Assuredly it would,' quoth he, 'because of a Matthew so magnified or etherialised we have absolutely no experience whatever.'

I should like to get a sight of that maximum. After my last long look at him, I should go away, saying to myself, In what a blessed state of mind must that being always awake, and always resign his sweetness and light to slumber! And when he takes his walk abroad, does he not hear, in the applauding rustle of the waving trees, the echo of his thought—

O fortunatam natam me culmine Terram!

(105.) I have expressed a doubt whether Mr. M. Arnold is prepared to define his word *power*, when he speaks of an Eternal Power that makes for righteousness. 'Power' is one of the rogueries called abstracts. Abstraction is of all callings the most disreputable. Any amount of sophism may lurk in the word power. Power as I know it in myself is I-can-hood; power in act, as I know it in me, is I can-and-will-hood in act. Power, as that which I infer from found relation of my will-power to a

correlative, is most simply and with least assumption intelligible to me, as another I-can-and-will-hood in act. If you tell me that there is no 'I can,' nor 'I will' in that inferred power, no Ego at work, you modify my first and easiest solution of the problem before me; you truncate the solution. I demand proof that you have the right which you assume to do this, proof that what I know to be sense has not by your trick of what you call abstraction been turned into nonsense.' More of this hereafter. It is enough to add here that *power* like *cause* is often degraded by our matter-and-must-be doctors into a mere antecedent, which is itself a consequent, in a sequence of changes.

If all personification, trope, and quibbling ambiguity be removed from Mr. M. Arnold's unctuous talk about the 'Eternal Power not ourselves, that makes for righteousness,' it will reduce itself to a respectable, commonplace, moralising atheism, or, if he prefers it, non-theism, recommended by Must-be so,—I know! But it is humbling to us proud Britons to confess, that there is not profundity enough in our language for the expression of his discoveries; and he must feel this acutely while strumming on his three-stringed lute his solitary psalm about the Eternal making for righteousness. What a pity he cannot teach us to deny our Maker

but in terms of a maker-for! A taker-for may be a taker, or a mistaker-for a mistaker; but it is intolerable that the wit of Mr. Matthew Arnold should be wasted on a language that permits any contact or comparison of making with making-for.

(106.) It will be a very useful thing for those who, out of respect for the gifts and graces of our matter-and-must-be doctors, have never looked closely at the wonderfully attenuated thread of logic and sense which runs through their positions, to study the following extracts from Mr. M. Arnold's paper in the 'Contemporary Review' for January 1875. The writer will allow no conscious intelligent cause: he will have no deity besides Must-be. One of his names for it is 'the Eternal that makes for righteousness,' of course a blind unconscious Eternal; for the conscious I AM THAT I AM is merely a magnified man. But the masses are not to learn the sublime secret of must-be philosophy: 'We say that the world cannot do without the Bible, and we desire to bring the masses to use the Bible' (p. 280). Wherefore there are to be two ways of speaking; the Bible way, for the masses, and the Must-be way, for the initiated.

The Westminster Reviewer brings him to book for affirming as a truth, truth verifiable, that the God of the Bible is this blind, eternal Must-be. He thus

replies (p. 281) : 'This objection we must deal with, and must establish if we can our assertion, that the God of Israel and of the Bible is the Eternal that makes for righteousness. First, however, it may be well to state clearly what by this assertion we mean, and what we do not mean.' This is a happy rebuke to the self-conceit of the Reviewer, who had evidently been reading 'Literature and Dogma,' under the assumption that somebody in Westminster was capable of discovering what an Arnold meant by his strongest fundamental assertions. The next words are: 'For the Westminster Reviewer objects to us, that "Israel must have had a faculty of abstract thought quite unparalleled, if his conception of God came to pass as Mr. Arnold describes it. A people in a very early stage of civilization is so deeply absorbed in the study and practice of morality, that they discover that there is a law, which is not themselves, which makes for it; which law they proceed to worship. Can improbability go further?"' 'This, says the Reviewer, is his *à priori* argument against the opinion that Israel's God was not a person, but the deification of a natural law. But certainly we do not mean, and the readers of "Literature and Dogma" will hardly have supposed us to mean, that Israel's God was a *conscious* deification of a natural law.'

What a pang for the poor Reviewer to read in

the flash of those italics, that everywhere, except in Westminster, Mr. Arnold's reader had caught the meaning which that dark region had missed! That the seed of Israel believed and taught to their children, that their patriarchs adored, that their seers proclaimed, and that Jesus unfolded from the Law, the Prophets, and the Psalms, the blind and senseless Deity of Must-be, is plain to all but stupid Reviewers, who could not see it invisibly asserted by Mr. Arnold that they did all this *unconsciously*! They were all atheists sure enough, but not *consciously*. Does the reader desire to know how Mr. Arnold goes on? After a little tautology, he goes on shining round something else, changing, like a wise man or a wiser woman, the topic of discourse, and beginning at another end.

One bit more from this crushing reply to objectors. At page 303 we read: 'Again, we have said, that it can be verified that Jesus is the Son of the Eternal that makes for righteousness. And the Westminster Reviewer objects that "To say that any man is the son of a natural law is absurd." But the Bible never speaks of the Eternal as a natural law, but always as if the power lived, breathed, and felt. Speaking as the Bible speaks, we say that Jesus is verifiably the Son of God; speaking as the "Westminster Review" speaks, and calling God a

natural law, we say that of this natural law Jesus is verifiably the offspring and the outcome.'

(107.) I add no comment on this duplicity of speech and variety of verification, nor on the logic of which it is supposed to be a connected portion. I desired only to give to the curious reader a peep at what these writers on law call a line of argument and a thread of thought: but what need of argument or thought in the magnification of Must-be? Must-be so! We know! That covers all deficiencies and answers all demands. Shall we ever have the happiness to see power in the hands of these matter-and-must-be doctors, with a staff of Matthew Arnolds to do the spiritual and to touch up the emotional? Shall we ever see the schools, the universities, the social precedences, the professional rewards, and in a large degree the nation's purse at their delightful disposal? May be so. It is comforting to hear their 'say' and their 'desire.' 'We,' who believe in a living God as much as our horses,—'We say that the world cannot do without the Bible, and we desire to bring the masses to use the Bible.' May be that the world and the masses may come into the grip of their emotional and scientific fingers. The sages and saints who have so many ways of speaking and verifying would easily discover, if they got England's law to back them, a variety of must-be ways, how to

bring the masses to this or that, as well as of dealing with all who contradicted them. And as the world has learned lessons for all time from the cruel despotism of priests, it may be destined to learn wisdom, neither less costly nor less enduring, from the dictation of matter-and-must-be philosophers, as soon as the realm of matter and what Dr. Huxley calls *law* 'is coextensive with knowledge, with feeling, and with action' (97).

The conclusions from the trains of thought in this and the preceding chapters, which to my faculties appear inevitable, are these.

First, by the absurdities inherent in the dogma of an absolutely minimum body existing in space, called *atom*, the stuff spoken of as *matter* is exploded, and disappears to scientific thought.

Secondly, by the absurdities in the atheistic dogma of a finite maximum intellect, now supreme in the Cosmos, the Being of God Omniscient and Almighty is confirmed. I say not, is demonstrated; for the demonstrations of logic concerning the infinite are of little value; and my belief in God rests on foundations in my soul, which are deeper and nobler than those of logic.

CHAPTER X.

THE FIFTH DEFINITE QUESTION IN PHILOSOPHY WITHOUT ASSUMPTIONS.

(108.) In Chapter II. we asked our first definite question: in Chapter V. (43) we proposed a question which was unavoidable, though not quite definite, because it contains the term matter, undefined and undefinable. In Chapter VIII. (80) we proposed two questions, tolerably definite, about *minima* and *maxima*, the discussion of which occupied Chapters VIII and IX.

It is useful here to propound a fifth clear question, the handling of which will remove the necessity under which I have been constrained of assuming without proof that I am in the presence of conscious thinkers like myself. This question is, Can I find with demonstration that there is in the Cosmos any conscious *being* besides myself? And, first, I shall deal with this question in a restricted form. I demand here, Can I find and demonstrate, without assumptions unproved, the existence of any finite conscious *thinker* besides myself?

I am not able to doubt for a moment that I am

now in a world full of such thinkers. I say to every man I converse with, Thou art, with a conviction of certainty differing in no appreciable measure from my conviction that I am, a conscious thinker. That my associates are verily before me as so many loci of force, I can as easily find with demonstration as I can find that wall; for I can in a moment summon into my self-consciousness that familiar relation of conflict between my will-force and the force which I encounter in them. But this is no demonstration of conscious thought either in their bodily locus or in the wall.

Every one of them is to my passive and to my active experience a very mobile group of phenomena, and nothing more; yet I find myself affirming the presence in him of that which is never phenomenon to me—namely, of consciousness, intelligence and will. Besides that which I know how to find by the test of my will, I am ever either assuming or inferring somehow in each of them, something more, which I cannot thus exactly find. And as I am determined to admit in science nothing beyond what I can demonstrate, I cannot be satisfied till I have either exploded the assumption, or formally proved the inference. It is very difficult for me to propose this problem as science in earnest to one with whom I converse in a common language. There is a round

of mutual concessions and assumptions in the use of language, which it is desirable to eliminate at this beginning of philosophy.

(109.) Let me be a Crusoe in a desert island. Rambling there in my metaphysical ponderings, I meet one day my black Friday, with whom I have not a word of language in common. From the first I am quite certain that I am in the presence of self-consciousness, and of limited thought and will, as real as my own. But I can no more find directly in terms of my own either passive or active experience, that self-consciousness in him, than he can find mine. He is to me what I am to him, a bundle of sensible phenomena; and, assumption and inference being excluded, he is nothing more to me nor I to him. Yet the inference is to me irresistible, in spite of my most determined scepticism, that there is indwelling in him a true personality and will, finite like my own, and of intelligence and power inferior to my own. I ask myself, how I am as a scientific thinker to justify this inference, without unproved assumptions? I do not justify my inference by saying that I cannot help making it. Such pleas as, I must make it,—It must of necessity be made,—I utterly contemn. I will have in my philosophy none of your miserable must-be's to fill up the voids of thought. Here I am, first saying to myself, This

Friday is a group of phenomena which perpetually indicate to my exact inspection a present and indwelling personal being having consciousness and limited intelligence and will: that is my datum after examination. Secondly, I find myself saying, Therefore, in this Friday there is a finite personal being, having such consciousness, intelligence and will. But that is not reasoning. You cannot build a logical argument with two propositions. If my inference is sound, there must be a true general proposition producible, which shall complete the syllogism. I must produce this, or else abandon my pretence of philosophical thinking.

(110.) I can write down more propositions than one which will complete a good syllogism. For example, thus:—In all groups of phenomena associated with a human form, continual indications of indwelling conscious intelligence and will are also demonstrations to me of such indwelling. This Friday is such a group of phenomena: Therefore his indications of such indwelling are to me demonstrations of it. But in the first premiss, the limitation to a human form is unscientific, because I am quite sure that, if Friday had three legs, I should make still the same inference from the phenomena. This cannot be the major proposition of which I am in search. Let me try another without this limitation of human form.

In all groups of phenomena which indicate continually the indwelling of conscious and imperfect intelligence and will, the indications are to me demonstrations of such indwelling. Friday is such a group of such indications. Therefore, in Friday are to me such demonstrations of indwelling intelligence and will. But the major term is unscientific, unless it be true that the validity of the indications of intelligence and will depends on their imperfection. If my knowledge or skill in any department could be enhanced to what is fit to be called perfection, would my indications to a competent observer, supposing such a one to exist, lose their value as demonstrations by losing their imperfection? I will not waste time on this, nor pretend to exhaust the number of assignable majors. I observe merely that the one required cannot begin with Some groups, nor with even All groups but one, of the defined indications; for we should have the middle term twice particular, which destroys the syllogism. It must begin with All groups. And I venture to say that, if my inference from the phenomenal Friday is a scientific one, there must be a perfectly general major proposition from which, or from an included case of which, it is concluded; and that major is neither more nor less than this—All groups of phenomena, which seem to me to be continual and consistent indications of con-

scious intelligence and will, are to me scientific demonstrations of the real presence and action of intelligence and will.

(111.) By the group of phenomena Friday, I mean everything that I can observe in him without recourse to assumptions or inferences. In studying the entire group, I am guided by what I know of the phenomena which I myself present to an observer, to consider as demonstrations of his finite personal being in consciousness only a limited number of the indications; not his colour nor his weight, but, for example, the signs of distress when he is hurt or hungry, and the various tokens of excitement, of purpose, of capacity, or incapacity. It is from these that I draw my inference of his human consciousness. In doing this correctly, I must have at least this major: Phenomena which, well examined by me, indicate the presence of an unseen human consciousness, are to me demonstrations of its presence with the phenomena. The phenomena which Friday presents are such indications, therefore the phenomena in Friday are demonstrations of his human consciousness. The major here employed is, in brief, All well-examined phenomenal indications to me of human consciousness are also demonstrations of it; so that from the seen I make by that major a scientific inference to the unseen. If I am asked how I prove

this major, I reply, That is a case comprehended in this more general theorem,—All continued and consistent phenomenal indications to me of invisible consciousness, intelligence, and will, are verily to me demonstrations of the unseen verities indicated. If, next, I am required to prove this most general proposition, I answer boldly, that it is a fundamental truth of reason, the denial of which is utterly absurd. Beyond that point I shall not pretend to debate. I leave it there; for wherever it is left, the appeal must be to the consciousness of rational thinkers. I do not here claim any formal logical triumph in this difficult topic over the men who consider this old inference from intelligent design and work to a conscious designer and worker as unphilosophical. I am familiar with the style in which they contrive to amuse themselves at my expense. I have not said in vain what I have uttered, if I have drawn attention more closely to what is involved in the broad assumption which these thinkers make at their starting-point, of the whole present tense of the verb 'to be.' They say each man to the other, Thou art a conscious thinker, with the certainty due to self-evident truth. Each one when he says 'I am,' expects the other to reply, 'Thou art,' with a scientific conviction loud as his own 'I am.' It would be a useful exercise of scientific thought if they would try to construct a

demonstration of this 'Thou art,' which will satisfy an exigent scepticism like that which they are elsewhere so forward to display. I have pointed out what they will come to if they do try. They will have to write down, as the only possible major of their demonstration, an enormous case of that implied general theorem which they are so many of them ready to deride.

(112.) It is possible that some of these men may decline the attempt to demonstrate the truth, 'Thou art a conscious thinker,' under the plea that they do not pronounce it as an absolute certainty of science. They may say, We make the assumption as a probable explanation of the phenomena, as we do in all our studies of nature; and we are satisfied with the verification of our hypothesis which experience supplies. But how can experience verify a supposition of that which cannot come into experience? And is it true that the conviction with which men say to each other, Thou art, is of the same rank and certainty as this—The tide will flow to morrow? or even as this—The tide at my feet is at this moment flowing? Some trouble of comparison would be required for a minute or two to verify that simple fact. How much bolder is the affirmation of a conscious spirit invisible here in converse with mine! We

state our convictions about external nature with an *if*: *if* the force continues so long in action. But when a man is looking into the eyes of his silent and motionless brother, where can he find an *if* to qualify his confession, Thou art, and thou continuest to be, a conscious thinker? Consider this affirmation of the noblest verity in a sphere to which I-the-thinker have absolutely no access.

This certainty to us all is not like the conviction which men have that there is an external world, that there is matter, that there is real space and time outside of themselves. All these things have been doubted; but I never heard of two philosophers who were able to doubt of their mutual 'Thou art,' any more than of their own 'I am.'

(113.) It cannot be mere philosophical trifling to ask for a justification of this conviction. If it can be justified by mere logic, the general theorem to which I have reduced it cannot be less than the fundamental truth which I have affirmed it to be.

But is it not an error to believe that the entire ground of human assent and conviction is purely logical? When I affirm 'I am' and 'I will' at my starting-point, I affirm all that is given when I am alone in this cosmos of forces, and what is sufficient for my first steps in philosophy. But something more springs into evidence at the starting-point,

when *the thinker* is face to face with his fellow-man. This is, in fact, conceded by those who explain our mutual certainty of each other's conscious being by social instinct and sympathy. These words to me are vague abstracts, which rather reaffirm than justify before sceptical science the conviction in question. The reference to instinct and sympathy correctly and clearly declares that the purely logical considerations never stand alone, when man says to man, Thou art a thinker. And we all know that it is mere affectation to pretend that we are only intellectual beings, who can state all that they most surely know in terms of cold science. We are moral beings. We have in society with each other desires and needs and mutual duties. The mutual needs and desires are sufficiently included as the less under the greater, in 'I am' and 'I will:' the duties have their root in 'I ought.' It is this which gives to the logical evidence of my brother's conscious thought, though in itself irrefutable, its supreme conviction to my soul. I OUGHT to treat him as one who thinks and feels; and the reproach due to me, if I affect to question my obligation to do it, by objections of sceptical refinement, is that I am not only a bad reasoner, but a bad man.

(114.) I say that the starting-point in Philosophy without Assumptions, of *man in the presence of man*,

is 'I am, I will, and I ought.' The verification of this proposition can be found only in consciousness.

We see the power of this imperative 'I ought' perhaps more clearly when we ask the wider question—How can I prove with demonstration that there is in the Cosmos any finite conscious *being* besides myself? In other words, how do we justify before philosophy without assumptions our conviction that a worm or any other animal can feel? We care little to argue with the ignorant or with the affected scepticism which doubts its capacity to feel, or with the wags who tell us that the victims of their torturing cruelty, in their aimless, blundering, or useless experiments, are no more conscious than the chords of a musical instrument. Scientific demonstration of the truth here is out of our reach. The question forces its way out of the domain of the purely speculative Reason into that of the practical Reason. We cannot keep the logical consideration apart from the moral. The great work of Kant is a monument for ever of the futility of attempting to construct a separate philosophy for each of these departments. The cold scientific arguments cannot be handled alone. Our determination that the dumb animal shall be treated as one that feels, is immoveable mainly because of the majestic presence of 'I ought,' before whom the strong arguments are

unfolded; and conscience bears witness that, if they were far less strong, they would be practically overpowering to every soul which is not depraved.

I am not writing a treatise on morals. I resist, with no little pang, the temptation presented by the sight of those Vivisectors, who, for no definite gain nor hopeful guess of Science, are now permitted to expose themselves even in the pages of the Royal Society.[1]

This short chapter touches a topic which I could not omit. It will not be without use, if it leads the reader, first, to meditate on the inconsistency of those reasoners who say to each other 'Thou art a thinker' with assurance invincible, on the strength of outward manifestations of intelligence and will from conscious beings invisible and utterly inaccessible behind the phenomena, and yet affect to scorn the belief of a Ruling 'I AM' in this ALL, so full of manifestations of infinitely greater cogency; and, secondly, to see how vain is the pretence that philosophical questions, even at the outset, can be logically handled all round without reference to that grandest of all the elements of reasoning—'I ought.'

[1] Vide Appendix on this Section.

CHAPTER XI.

THE WILL, AND MR. HERBERT SPENCER.

(115.) My beginning of philosophy compels me to discourse of my will. I know that I have a free will. The evidence is from consciousness and conscience. If my will is not free, 'I ought' is a perpetual delusion. My joy at having done, or my pain at having left undone, my duty at a given moment, as distinct from my self-indulgence and self-seeking, is a silly superstition; and duty in general, as distinct from the calculation of present and proximate utility to the parties whom it concerns, is the most unmeaning of all abstractions. If I am not really a free agent within a certain sphere, as well as the subject of controlling and compelling forces in a wider, the most swift and imperative, and by common consent, the most noble sentiments of my soul, those of moral praise and blame, have no foundation in truth or reason, and are therefore, like all other falsehoods, deserving of the contempt of philosophy without assumptions. As a scientific thinker I know

that I am, within certain limits of choice and action, absolutely free from all compulsion of the forces, vital, social, or dynamical, which I find at work in the Cosmos. As a moral being, I know that I am justly accountable, within a sphere about whose limits I am sufficiently informed for my general duty and peace, to my Cause and Preserver (of whom more in the next chapter), for my use of my faculties of thought and action. The proof of all this I have in my verifications of 'I can,' 'I will,' and 'I ought;' verifications from consciousness and conscience, in the presence of which the sophistries and contradictions of matter-and-must-be philosophers are vain and frivolous even in logic, to say nothing of morals. These men are very condescending and considerate in assuring me that, if I accept the scientific decrees of their Vatican, they will invent something nice and comfortable to satisfy the cravings of my emotions and my conscience.

(116.) In these days of clamour about the reign of law, raised by men unable to write down with proof the scientific expression of any three different laws, which continuously work from point to point and from moment to moment in the universe, and which are more than statements of vulgar and discontinuous sequences, with depths unfathomable of ignorance in space and time between them, or than

their everlasting chorus of must be so! we know!—the question of free will is everywhere tabooed, or touched in trembling tones before our fashionable philosophers. The assumption is, nay the credulous concession too often is, from assertors of free will, that the arguments against it, if fully stated, are absolutely unanswerable. I, too, here record my sentence that they are quite unanswerable. They fall into two classes. The first is made up of a variety of expressions, with decorations of sophisms and circles, of the all-convincing *must-be's* of our necessarians, positivists, and materialists. Am I expected to refute a donkey's circle? Am I to handle in philosophy without assumptions those wretched *must-be's*? Without any disrespect to the gentlemen who place them there, I kick them out of my path. That is the scientific use of such wind-bags. These *must-be's* are more offensive to my intellect than the cursing dogmatisms of the Churches. They do not indeed consign me, as the warring theologians do, to ten thousand degrees Fahrenheit; but they make one sickening pretence which the Churches never make—they pretend to be teachers of science! I say again, they are merely the rags that hang, not sweetly, on the shivering flanks of Ignorance. I spurn them from me. That makes room for real verifiable facts and for logical induc-

tions. The other class is, the demonstrations of those worthy men who are so learned about the nature and connexion of the Divine attributes, the sages who comprehend the incomprehensible. Forsooth, they have soared away to the Infinite, and studied the matter there; and they come back to inform us how we all look from that end! I never heed them. They have not been at that end. My science is all at this end, in the finite. All their wise deliverances about this matter are liable to this fatal objection of logic, that they are propositions containing the Infinite. Do you expect me, a sceptical mathematician, to answer them? In mathematical science such propositions frequently present themselves, and we know how to deal with them. We lay them aside. We never allow one of them to be a step or a starting-point in our reasoning. There is no end to the absurdities which we could demonstrate if we so employed them. And they are of no more value in any other science of the finite than in mathematics. Every proposition containing the Infinite is, in the sciences of the finite, an instrument of sophism. I find that all the arguments which timid thinkers hold to be so tremendously cogent against free-will, and before which, forsooth, conscience and self-consciousness are to be shamed into silence, are of these two inadmissible classes. I

think that I have good reason for contemning them all.

(117.) The contradiction which is supposed to lurk in the doctrine of free-will can never be exhibited, until some proposition utterly unscientific has been first laid down as a scientific premiss; either some contemptible affirmation of the glory of Must-be, or something that displays the mastery which the speaker has obtained over the mysteries of the Divine attributes, and his power of thinking through the Infinite. Is not this good reason why, in trying to frame a philosophy without assumptions in the field of the finite, I should prefer the perpetual testimony of my consciousness to the dogmas of matter-and-must-be doctors?

(118.) Yet I, too, know how to make for myself propositions containing the Infinite: they are but few, and I do not like to call them science; but they have an evidence, a beauty, a power, and a majesty, they have an inspiration and a consolation, unknown to the theorems of the science which I love. A life of mere intellect were to me in this planet a life not worth living. My vocation in this world is to learn, to live, and to teach, a nobler life than that. I can find my way into two kingdoms of thought. In one I am a bold enquirer and a sceptical reasoner, on all propositions of saints or sinners about the finite of

the present or the past. In the other, where I love to wonder and to exult about the Infinite, the unseen, and the future, I glory in being a believer, a thanksgiver, an obeyer, and a worshipper. And the only firm foundation stones, from which I can walk into the one, or essay to climb into the other, are these—I am, I ought, I can, and I will.

(119.) The strongest argument, after all, for the assertion of free-will, before the eyes of a good doubter, is the futility of the arguments brought against it. An appeal to facts of consciousness and conscience is made in few words: the sophisms and vicious circles of the denier occupy a broad space, and yield a broader fun.

One demonstration that my will is not free, which is found in the writings of Priestley, and was used thousands of years before he was born, is greatly applauded for its brevity and force. It is stated thus: *A will undetermined is an effect without a cause, which is an absurdity.* It is short, but long enough to be a blundering sophism. It affirms to me implicitly two things, if I am to be treated as a sceptical and verifying thinker—and I shall insist upon being so treated—one true, the other false. The true thing is, that I can find effects with what are called their causes. I grant that I can find them in plenty.

The false thing is, that I can find my will amongst these effects. I know of no effects, different from logical conclusions from known premisses, except manifestations of force or of will-force, and my will is (32) my only instrument for finding either.

As my will is my only force-finder, it is my only effect-finder; and it is absurd to say that I can find my finder among these effects. Could Priestley, when carving his goose, carve his carving-knife? No; no more can the reader or any other thinker find his finder among the effects which he finds by his will. This admired argument is a *petitio principii*, which, if expanded, works itself out into the ridiculous circle exposed in (76).

I shall take the liberty to doubt every statement that another thinker may make to me about the sort of fact or effect that my will is, or that my volition was, until I have verified his statement for myself by demonstration that I can repeat at pleasure.

(120.) No man can without a sophism ask me to assign from the not-me-the-thinker a cause or a reason for my past volition, which will account for the whole fact. The most complete statement of desires, motives, and arguments preceding the act of will cannot explain it. As my will is my only force-finder, whether the force be logical or dynamical, so it is my only fact-finder, where fact is act, due to

force of any kind. It is no more possible for me to find my will among facts found with their reasons, than among effects found with their causes. My free volition can never be known or imagined by me either as an effect without a cause, or a fact without a reason. I, there and then, am both the cause and the reason of it, such cause or reason as can be sought or found in the science of the finite.

To this presentation of myself-the-thinker as sufficient cause and reason of my volition, my opponents have no reply, except the remark that it is a quibble, which evades, not solves the question scientifically. But they have never shown that it is a quibble. This 'I am and I will' from which my only possible philosophy at every moment begins, is no quibble. It is a fact and a force of the Cosmos, the first of all given to me, and that with a certainty transcending all deductions from it. This helpless pretence of a quibble is a silly demand, enforced only by *must-be*, that I shall begin before the beginning, and go down below the bottom: it means, We will have no logic but circular logic.

The chief quibble that can be pointed out in this matter is the barefaced one which the logicians of the school of J. S. Mill insist upon using, in their degradation of the word *cause*, for which they sub-

stitute, whenever it suits them, *an antecedent in time.* I shall say more on this subject in my chapter on Causation.

(121.) I should do injustice to my argument, in the present tendency of credulous opinion, if I failed to place before the reader the denial given by the admired philosopher, Mr. Herbert Spencer, to almost every word that I have uttered about 'I am' and 'I will.'[1] He does not begin his 'Psychology' with these. He takes a loftier flight into Mind in the abstract, Life and Consciousness in the abstract, Intelligence in the abstract; and only after ballooning in the clouds for nearly five hundred pages does he condescend to consider those antiquated institutions, the subsisting personal Ego, and the human Will. He devotes eight pages to them; and I am very sure he would have been only too happy to have been excused from considering them at all. The surest way to abolish these institutions is to extinguish the Ego; for, that once out of existence, its supposed attribute, Will, vanishes of course. I shall quote only from his very short Chapter IX., entitled The Will. He begins, as is usual with these writers, by showing his diamonds. *Must-be's* are the diamonds of their *à priori* thought. They

[1] The substance of this section and the remaining sections of this chapter may be found in a paper read by me before the Literary and Philosophical Society of Liverpool, in their Proceedings, 1872–3.

scorn everything below diamonds. The Will, says he at the outset, is *necessitated* by the same conditions as Memory, Reason, and Feeling; it *must be* exhibited just like them. In § 219, after describing the current illusion about the Will, he tries to kill it by killing the stronger illusion about subsisting personal identity on which it depends. We read—'Considered as an internal perception, the illusion consists in supposing that at each moment the *Ego* is something more than the aggregate of feelings and ideas, actual and nascent, which then exists. A man who, after being subject to an impulse consisting of a group of psychical states, real or ideal, performs a certain action, usually asserts that he determined to perform the action; and, by speaking of his conscious self as having been something separate from the group of psychical states constituting the impulse, is led into the error of supposing that it was not the impulse alone which determined the action. But the entire group of psychical states which constituted the antecedent of the action, also constituted himself at that moment—constituted his psychical self, that is, as distinguished from his physical self.' The dogmatic assertion, without any attempt at proof, that the conscious psychical or mental Ego at any moment is simply the aggregate of states of consciousness at that mo-

ment, and the converse, that this aggregate of conscious states, 'feelings and ideas,' or again, 'this composite psychical state' at any moment, is the mental Ego at that moment, all this is repeated in this section, in many forms both positive and negative: 'psychically considered, he is at that moment nothing more than the composite state of consciousness.' There is no mystery in the wonderfully learned term psychical, although the cunning distinction between the psychical and the physical Ego is very useful, no doubt. It is elsewhere defined that every state or change of consciousness, perceived in consciousness, is a psychical state or change; be it conscious sensation, conscious feeling, or idea of any kind.

(122.) Observe, first, that the vulgar notion of the Ego, that it has to these states and changes, to these feelings and ideas, the relation of subject to attribute, or of subject to affection, is exploded. There is no relation between the psychical Ego of the moment and the psychical state of the moment, but the relation of pure identity. The Ego is identically the aggregate or group of states: the aggregate or group is identically the Ego: whether you speak correctly of your Ego, or of any other, you are bound everywhere rigorously to think this identity. Now as the aggregate of one moment is never the identical

aggregate of the preceding or of the succeeding moment (for every change in visual perception changes the aggregate), what we call our conscious personal identity from moment to moment is a ridiculous fiction, and the loudest testimony of our inmost consciousness is a perpetual lie. That simply follows from these dogmatic assertions, and I shall not dwell upon it; my business is to examine the bare nonsense of the assertions, not to deduce the nonsense which plainly flows from them. It will suffice to examine a single sentence, which I will cite once more. Observe that the subject or nominative is '*a man*.' 'A man who, after being subject to an impulse consisting of a group of psychical states, real or ideal, performs a certain action, usually asserts (observe that the *man* first named asserts) that he determined to perform the action; and, by speaking of his conscious self as having been *something separate* from the groups of psychical states constituting the impulse, is led into the error of supposing that it was not the impulse alone which determined the action.' Who is led into the error? Clearly the man who asserts, the man first named. Now since to be led into the error of *supposing* himself something separate is a psychical state, the man first named is a conscious psychical, that is, a mental *Ego*, not a physical man, who is merely seen walking or heard asserting.

This psychical man is described as in error, both in what he thinks and what he asserts about himself; but of course our philosopher can neither think nor speak but with the exactness of his own science. The philosopher speaks and thinks of 'a man who is subject to an impulse consisting of a group of psychical states,' and the man is a psychical Ego. Let E denote this Ego, and let G denote this group of states. Now at the moment of the consciously received impulse, E is by Mr. Spencer's definition identically G; and his conception of the fact of that moment is that G is subject to and conscious of the impulse G. But since the receiver of an impulse must be there to receive it, Mr. Spencer's thought seems to be that G finds itself assaulted by G before G is either assaulted or born. Was that verily his thought? No. I venture to say that both in this place, where he speaks of a psychical Ego, which is the subject of an impulse G, and lower down in the same section, where he speaks of an Ego which is 'the subject of such psychical changes,' he is thinking as he is speaking of a subject mental Ego—that is, something separate from the group G, which G is in one place 'the impulse,' and in another 'the psychical changes' to which the Ego is affirmed to be subject. And we see that, if he be thinking at all, and, not merely pushing about a set of empty symbols in

à ' sort of thimblerig of words, he is conceiving what he cannot help expressing, that the psychical subject E is not identically G, but something separate from G. And where is the harm of that? Simply that Mr. Spencer goes on to censure the blunder of this thinking Ego in 'speaking of his conscious self as having been something separate from the group of psychical states constituting the impulse.' The harm is merely this bit of precious nonsense, that, if Mr. Spencer is thinking, and not thimblerigging, he is committing, in spite of his dogmatising, the very blunder which he censures: and he cannot help committing it.

(123.) I shall not poke farther into this unscientific pudding. Every thinking reader must judge of the nonsense for himself; and he may multiply it by ten, if he chooses to compare the Ego of this § 219 with the account of consciousness proper in § 180, where it is not a group at all. The reader may at his leisure study this identity, 'an impulse consisting of a group of psychical states;' and try to find out how 'impulse,' something dynamical and active, can be equivalent in scientific definition with 'state,' something statical and passive. One little sophism like this is quite a capital in the trade of matter-and-must-be philosophy, that can be turned over and over with wonderful profit.

(124.) Here the reader may well ask, Is there nothing in this section (219) besides the dogmatic assertions that you have quoted, with their decorations of absurdity—is there nothing like argument for the demolition of subsisting personal identity? I am happy to say there is one, though but one, argument: it is only a little one, and the reader shall have it, word for word. We read in this same section: 'Either the *Ego*, which is supposed to determine or will the action, is present in consciousness or it is not.' That is promising, and looks like close quarters; that is verily the way in which a good reasoner opens an exhaustive argument. He goes on: 'If it is not present in consciousness, it is something of which we are unconscious—something, therefore, of whose existence we neither have nor can have any evidence.' That, you say, may pass for true, if it is not very profound. Let me entreat your attention to the remainder. 'If it is present in consciousness, then, as it is ever present, it can be at each moment nothing else than the state of consciousness, simple or compound, passing at the moment.' You all seem puzzled. I will give him a fair chance; I will read it once more. You are bothered still: you ask me whether there is not some printer's blunder in the third part; the very question I should ask if in your place. I confess that it would sound like sense

to me if it stood thus: If it is present in consciousness, then, as it is ever present (not fleeting and passing at the moment), it cannot be merely the state of consciousness passing at the moment. To my faculties that would appear to be sense; but I assure you that the very contrary is what is read here, and it is impossible to reduce it to a typographical error. These are the very words: 'If it is present in consciousness, then, as it is ever present (not passing at the moment), it can be at each moment nothing else than the state of consciousness, simple or compound, passing at the moment.' How can the fact that it is ever present, and not passing, be a demonstration that it is nothing else than what is passing at the moment? To all the wits I have this is deplorable nonsense. And if it were sense, where is the argument that he promised us in that logical flourish at the beginning? He wants to prove to us that the *Ego* is nothing else than the state of consciousness passing at the moment. And he proves it simply thus, by shouting out louder than before, 'It can be nothing else!' To me it is helpless, hopeless nonsense all.

Here we see what a figure Mr. Spencer cuts, when, alighting from his balloon, he tries, what he does not attempt once in three hundred pages, to go in to a definite position on solid ground, and handle

his logical weapon at close quarters. He seems dreadfully puzzled about which is the right and which the wrong end of it!

(125.) This subsisting personal Ego is yet unslain; and that provoking enemy, Will, confronts Mr. Herbert Spencer as before. I must give a clear account of his campaign against Will. His hostile arguments have in my favour ten times the force of my own, which is mainly an appeal to consciousness. I hope that the reader will not find his patience abused by a full statement of my opponent's positions. He treats first of my subjective illusion about my own will; next he gives the most wonderful illustration of my objective illusion in attributing a free will to another; and, finally, he loses patience with our stupidity, and takes his revenge by impaling himself without mercy. He and I quite understand each other, both about the facts of volition and the names of them. He does not dispose of my will, as he does of my subsisting personality, by simply wiping it out of existence. We both affirm that we perform voluntary and involuntary acts. We agree that there is will or volition in every voluntary act. But he knows, and I do not know, how to evolve, to analyse, and thoroughly to expound Will. All that I can say is this; that in my voluntary act I freely originate and contribute, at my special choice

and expense of effort, an initial something which I call my will in act or my will-force; and I affirm that in the changes of my passive and involuntary states, I am conscious of nothing at all so contributed by me at my choice. But this bold antagonist assures me, with what sort of logic we shall speedily see, that in both these states, which I call active and passive, I am always neither more nor less than a process and sequence of inevitable changing groups, and that my notions of my choice, of my originating or contributing anything more of action in one state than another, are a foolish and perpetual illusion. He informs me that all my changes are absolute necessities of adjusted relations, which he can express by his *must-be's*; and he is of opinion that I ought, like him, to watch them calmly and philosophically, as something going on under my mere inspection, just as my changes of temperature go on. But as he is compelled to allow that in my consciousness of voluntary act there is a certain real fact which I blunderingly claim as my special contribution of choice and force, he is bound to do what he greatly dislikes, to confine his remarks to this one precise fact. I know it quite well, says he; I, too, call it will, or volition, both terms denoting the same thing.

(126.) I cannot undertake to put the reader in possession of the exact import of the terms which he

employs. I am convinced that he and his admirers are familiar with dozens of long words in -eity and -ality, in -ility and -ivity and -ation, about whose definitions they seldom trouble themselves ; especially those imperial terms, the differentiation, and the integration, and the co-ordination, and the re-differentiation, of the simultaneities and the serialities, of the progressions, the coherences, the relativities and the correspondences. Why in the world need they trouble themselves ? Those long-tailed abstracts know how to take good care of themselves : you may knock them about in heaps as you please ; they never fail to tumble up as clear and perfect as when new from the mint, and at a glance you can distinguish them, and swear to them again. Time enough to bother yourself about exact definitions, applications, and verifications, when you have finished philosophising in general.

(127.) In § 218 we find the genesis or evolution of volition out of automatic action. The most oracular form of the dogma is given thus : 'The cessation of automatic action and the dawn of volition are the same thing.' Hear, with faith and reverence, this Evolution in § 218 of Will : 'When the automatic actions become so involved, so varied in kind and severally so unfrequent, as no longer to be performed with unhesitating precision—when, after reception of

one of the more complex impressions, the appropriate motor changes become nascent, but are prevented from passing into immediate action by the antagonism of certain other nascent motor changes appropriate to some nearly allied impression; there is constituted a state of consciousness which, when it finally issues in action, displays what we term volition.' We need not try our powers upon anything more than the concluding sentence—'there is constituted a state of consciousness which, when it finally issues in action, displays what we term volition.' Let the state of consciousness be called C, let W be the displayed will or volition, and A the action; then C W A is the combination, namely, a state of consciousness C, which displays will or volition W, when it issues in action A. Observe that nothing comes between C and A except W, for C is said to issue or end in A, at that moment displaying W, which of course precedes A. We may now ask, without disturbing our conception of the facts in their order: What is the state C of consciousness? The answer is clear from the preceding words. 'When the appropriate motor changes become nascent, but are prevented from passing into immediate action by the antagonism of certain other nascent motor changes appropriate to some nearly allied impression, there is constituted a state of consciousness,' namely, this C. Whatever

else is dark, one thing is clear; that C is a state of conscious antagonism between the appropriate changes and certain others not quite appropriate. If you can lay hold of this character of conscious antagonism in C, you have the pith of the matter. Hear this more distinctly in the next sentence but one: 'We have therefore a conflict between two sets of ideal motor changes, which severally tend to become real, and one of which eventually does become real; and this passing of an ideal motor change into a real one, we distinguish as Will.' The conflict spoken of is the state C of consciousness, in which we distinguish one ideal motor change as it passes into action A, and thus becomes a real change, from the other conflicting ideal changes which do not become real. And this act of distinguishing, I fancy, he points out to us as W, our Will, which we are so foolish as to imagine something more than a mere note of observation.

This genesis of Will is far from being so dashing as the author's Evolution of Consciousness. Our demiurge does not enjoy this topic at all. He is afraid of it. Volition, 'what we term volition,' is once named, as something which, at a vanishing moment, is *displayed*. Will, the same fact, is once pointed to, as something about which *we distinguish*. No more: he touches it delicately; he is as gentle and

as cautious as a bishop; and if he were a bishop, we could hardly be left more in the dark about his positive ideas on the subject. But we shall see that he lets out quite enough for my purpose.

'(127*a*.) The formula C W A is thus obtained by triumphant evolution, as the chemico-physiological equivalent for all and every voluntary action. The reasoning is perfectly general, covering every action in which will is conceivable. Where all is unhesitating precision in the changes, we are told, the action of the conscious organism is automatic, or void of all volition; and it is only by virtue of the antagonism and conflict among the nascent motor changes, that Will or Volition can arise. Calling C consciousness of conflict, the law is, no C, no W; and if there be no W, no will, the action is automatic and not voluntary at all. Thus we can compare the evolution of will with that of consciousness. Consciousness was evolved in the unconscious organism by a continual rush of changes through the central turnstile. So long as it is an unhesitating rush, it is automatic life and action in the conscious organism. But for volition we must have more than rush; we must have a lock and a choke, and in fact a row. That row is the evolution of will. However swiftly the motor changes press through peaceably, all is automatic; there is no volition till they begin to

collar, to cuff, and hammer one another. Does anybody ask for proof? When Mr. Spencer, by the study of Mind in general, has found this out, and says it, and so many philosophical ladies and gentlemen stick to it, do you demand proof? I say it proves itself. How can there be conflict and cuffing without the evolution of voluntary action?

(128.) I have now only one little sentence more to quote, which follows next on what I have already cited. The appeal is there made to what we find in consciousness by way of confirmation of this evolution of will. Thus: 'In a voluntary act of the simplest kind, we can find nothing beyond a mental representation of the act, followed by a performance of it.' We can find nothing, says he, but a mental representation of it R, followed by a performance of it P. R P is all that I can find in this voluntary act. I accede to that, provided that I am allowed to find my will-force there; and P cannot be the performance of a voluntary act A, unless it has the form W A. Making that substitution, which is evidently just what Mr. Spencer means, while allowing to him of course his own conception, if he has one, of the meaning of W, we have R W A for the new equivalent of any voluntary act of the simplest kind. And the theorem now is that we find by consciousness nothing more in any such voluntary act. I am quite

willing to confess that, in moving my finger, swallowing my food—which is, I fancy, the oldest voluntary act in all my pedigree—or in feeling my lips with my tongue, or in more complex acts, such as clambering over a stile or in mounting my horse, I find a state of consciousness R, the representation of the coming act A, my will-force W, and the act A itself; and that is probably about all that I can observe or remember. These two formulæ or equivalents for the same voluntary act, one obtained by evolution, and the other from Mr. Spencer's own inspection of consciousness, must be identical, supposing that our philosopher is not amusing himself by talking nonsense. That is, R W A = C W A, which is impossible, unless R and C are exactly the same state of consciousness, proximate to will. But R is by definition rigorously nothing but the mental representation of the coming act A, while C is by definition that and much more, viz., a state of conflict in consciousness between the idea of A and the idea of some act not performed. C is defined as an antagonism, and next as a conflict between two sets of ideal motor changes, which severally tend to become real, and one of which eventually does become real. Thus the state of consciousness which issues in voluntary action *is* only, and *is not* only, the mental represen-

tation of the coming act. *Ergo*, Mr. Spencer is amusing himself by talking nonsense; Q. E. D.

(129.) I must add one word concerning the automatic action and the spontaneity, about which our physiologists and psychologists write so learnedly. I do not believe a single word of what they say about the transformation of the voluntary into automatic and the converse. They tell us how the child at the breast is sucking and swallowing automatically. How am I to find that out? How did they find it out? How do they know that, if they could remember their own sucking and swallowing at the breast, it would not be exactly the memory of volition? That sort of science will not suit a sceptic like me. They tell me how they walk automatically, while conversing or pondering, and how the young ladies play the piano automatically, chatting vigorously all the time to them! Where do they get their demonstrations? I believe it is a mere blundering inference from the blanks of memory. A voluntary action which occupies a second, say the execution of a musical phrase, and which is by repetition very easy and natural, may possibly be commanded by an act of volition which occupies the thousandth part, and leaves a trace in memory that is effaced by the occupation of the huge remainder, of the second. This *automatic* is no less an error of science than of Greek.

(130.) Before I pass to the gorgeous illustration which I promised of the blunders of free-will, I ought to notice the only reference which Mr. Spencer makes to the statements of his antagonists. His reference is simply a very old and a very easy misrepresentation. I do not say it is a wilful misrepresentation. He puffs it out, in his mighty cloud, all about the confused conceptions of other people. His words are these, in § 219: 'That everyone is at liberty to do what he desires to do (supposing that there are no external hindrances), all admit; though people of confused ideas commonly suppose this to be the thing denied. But that everyone is at liberty to desire or not to desire, which is the real proposition involved in the dogma of free-will, is negatived as much by the analysis of consciousness as by the contents of the preceding chapters.' He pretends that my real proposition, when I assert my free will-force, is that I am at liberty to desire or not to desire. To his unproved assertion I oppose my distinct contradiction of his words, along with my appeal to the consciousness and the conscience of every one of my readers; for on this topic conscience is as loud a witness as consciousness, if this were the place to call on her. I content myself with repeating what I and others have often said before, although it does not suit the purpose of these simplifiers of the Cosmos

to hear it or to answer it. I know and I admit all that Mr. Spencer can enumerate of the urgency of motives, arguments, and desires. It is a simple untruth to say that I maintain this only, that I am at liberty to desire or not to desire. But this I say, that no arguments, motives, or desires whatever can issue in my voluntary act, but on two conditions; first, that I freely choose the time, the manner, and the measure of force for the performance of the act; and, secondly, that I freely put forth that will-force which sets in motion for the act these instruments which are placed under the command of my will. I know that I have no proof to others of this beyond this old appeal, Γνῶθι σεαυτόν. We are luckily not all bound to begin our philosophy in Mr. Spencer's balloon. That human will is not simply a movement of appetite or desire, was shown not long ago by an example of supreme and terrific force, when a criminal, under sentence of death by the hangman, chose to die of hunger and thirst: he willed it, and he did it, in spite of all human efforts to prevent him.

(131.) The reader shall be rewarded now for his patience by the sublime illustration, and next by the still more awful self-sacrifice. In § 219 we are thus made ashamed of our objective illusion when we talk of each other's freedom: 'The irregularity and

apparent freedom are inevitable results of the complexity; and equally arise in the organic world under parallel conditions. (Note that, parallel conditions.) To amplify an illustration before used: A body in space, subject to the attraction of a single other body, moves in a direction that can be accurately predicted. If subject to the attractions of two bodies, its course is but approximately calculable. If subject to the attractions of three bodies, its course can be calculated with still less precision. And if it is surrounded by bodies of all sizes at all distances, its motion will be apparently uninfluenced by any of them: it will move in some undefinable varying line that appears to be self-determined: it will seem to be *free*. Similarly, in proportion as the cohesions of each psychical state to others become great in number and various in degree, the psychical changes will become incalculable and apparently subject to no law.' That seems to stick together; there is a definite thread through it, which is more than I can say for scores of pages of Mr. Spencer's integrations of what he calls coherences. Mr. Spencer has had a point in his eye, and has gone pretty straight to it. And the illustration, considering that it does not illustrate anything, is original and ingenious. He has evidently heard that the problem of two mutually attractive bodies moving in space has been com-

pletely and generally solved; also that the mathematicians are beaten hitherto in their attempts to solve in the same way the problem of three bodies. And he is quite right in saying that they have less notion of the general solution of that of four or more bodies attracting each other. Thus then he begins: perfect accuracy of prediction when there are before us two bodies only; less accuracy for three, still less for four, and so on; so that if, says he, to make quite sure, I surround the moving body with others of all sizes at all distances, the error of prediction will be unlimited, the body's path will be quite undefinable; it will seem free, and free-will is floored for ever.

(132.) Observe that this is science: 'surrounded by bodies of all sizes at all distances.' Then at one-tenth or one-hundredth of an inch from the body in space there is somewhere a body of every size. That is puzzling. He chooses to speak of a moving body which cannot move. Why not? He who has abolished the gulf between the unconscious and the conscious; who has wiped out the difference between personality and personal experience, between subject and attribute, between active and passive, between dynamical and statical—why should not he, if he thinks fit, expunge the distinction between motion and rest? But perhaps he will forgive me if

I make a little room for the poor body to go. Instead of *all* I will put *innumerable*, and read it again. If it is an error of the author, it is only *all* for *some*, *all* for *not all*, twice over. A moving body in space so surrounded, says he, will have a path undefinable: it will appear self-determined: it will seem free. We are all bound to accept Mr. Spencer's statement of his view of the phenomenon, as of something free and self-determined. He does not inform us to how many nor to whom it seems free; but he is sure that such is and inevitably will be the appearance of the thing. Nor can we doubt that he is aware that the moon is rigorously one case of his general supposition, coming exactly under the description in every point. It is a body, a body in space, surrounded by innumerable other bodies at innumerable distances. There are scores of them in our solar system, and millions beyond it, every one of which contributes something to the moon's motion. Our Milton loved—

> To behold the wandering moon
> Riding near her highest noon,
> Like one that hath been led astray,
> Through the heaven's wide pathless way.

But his view of that lost moon, so wandering free at her innocent will, was obtained only in a passing moment of fine poetic fancy. Mr. Spencer gets

that highly imaginative peep every time he looks at her, and talks of it in his philosophy as a thing of course and of necessity. The old gentleman in the French play was wonderfully pleased to learn that he had been talking prose all his life without knowing it. What rapture is in store for Mr. Spencer, if ever he finds out that he has been talking poetry without knowing it! His very prose is poetry!

(133.) I think it very marvellous that nobody ever informed this poetical and positive writer that the moon does not seem free one bit, that she does not appear self-determined, that she is not rambling in any undefinable varying line, that her motion is not apparently uninfluenced by any of the other bodies; although he has actually written and printed about her and every other planet all these incredibly foolish things. Her movements are computed and predicted with a refined accuracy, with all the accuracy required within the limits of human observation and appreciation. The same thing is true, or can be made true by a certain amount of laborious registering and figuring, of every other body in the system. In spite of the difficulties of the general problems, which aim at solving all possible cases at once in *a b c*, our astronomers have methods, effectual for the needs of theory and practice, of dealing with the given system under their inspection. Nor do I believe that there

is a group of associated bodies in the Cosmos, which can be observed by human eyes, of which a thoroughly correct account would not be given, if our Astronomer Royal could get a ride upon one of them long enough, with his staff and his instruments, and with free access to what stations he chose. I say it is marvellous that none of those learned ornaments of the fashionable super-positive-negative philosophy, who are all so proud of Mr. Spencer, has had the kindness to prevent him from publishing a second edition of this accumulation of sublimely comical blunders,—publishing them in the most solemn and important chapter of his two volumes of 'Psychology,' that upon Will, and, what is more, reproducing them in the only section of that chapter, § 219, which contains anything that pretends to be an argument. This huge mare's nest is his only argument, besides arrant dogmatism, good enough for stuffing a Theological Chair.

(134.) The muddle here made is very much like that of one who, having heard that mathematicians cannot solve the general equation of the fifth degree, should jump to the conclusion that they cannot find accurately the roots of such an equation. The truth is, that if to the co-efficients *a b c d e* you give any numerical values that you please, thus presenting to us a definite single case, instead of all cases at once,

we can find all the roots to any degree of accuracy, to a hundred decimal places if required. And the same thing is true of every algebraic equation of any degree; they can all be solved, if the co-efficients are numerical, with unlimited approximation: and you can effect nothing more in the solution of a quadratic, if you demand a numerical answer; for it is millions to one that the root is incommensurable.

This illustration of Mr. Spencer's is the most astonishing that ever decorated a book of science.

(135.) The first blunder is this: 'A body in space, subject to the attractions of a single other body, moves in a direction that can be accurately predicted. It is true that general expressions for the required variables are exactly known. But there can be no accurate prediction about such a body without numerical computation; and the only possible result of that will be an approximation, since every formula contains incommensurables. The accurate prediction of which he is thinking, and which he asserts, namely, something more than approximation, is impossible. Thus the first assertion is untrue; and equally untrue is every word that follows in the building of this stately argument, to show that the accuracy of the attainable approximations diminishes in proportion to the increase of disturbing bodies. The motion of the moon in the presence of all those countless dis-

turbances is predicted with all the accuracy that human eyes can appreciate; and that accuracy can be enhanced, if it is required, by known methods.

(136.) Judging equitably, from the evidence before me, of Mr. Spencer's notions about exact science, I think it highly probable that the prediction of which he knows so much in the case of only two bodies in space, is in his opinion a mighty simple achievement compared with his discoveries about Evolution. I fancy that it may be useful to him and to his admirers to get a glimpse of the notions of those who have really been taught to put a clear meaning into his favourite grand words, differentiation and integration. I say that to find the relation between the place x and the time t from the origin of motion, of a body gravitating in a right line towards a centre of force,—to say nothing of the sublime achievements of Newton in the theory of elliptical motion,—I say that the solution of that simplest problem of rectilinear movement is incomparably a greater exploit of human wit and genius than all the biologies and psychologies now in the world or likely to be seen in it for a century or two to come. I would rather, I would a hundred times rather, have the glory of constructing, upon the ground-work of simple arithmetic, that apparently easy solution, comprising as it does all that elegant

analysis and faultless reasoning with those millennial accumulations of victorious thought and magnificent invention, than have the credit of all the demonstrated brain-work that Mr. Spencer, with any five hundred Biologists, Psychologists, and Evolutionists to help him, could accomplish in the longest lifetime.

(137.) Glance now for a moment from the illustration to the thing illustrated. It is what he calls our 'objective illusion.' He says, 'the actions of other individuals, lacking as they do that uniformity characterising phenomena of which the laws are known, appear to be lawless—appear to be under no necessity of following any particular order; and are hence supposed to be determined by the unknown independent something called the Will.' Is it true that this illusion is upon you and me? Do we 'hence' ascribe Will to each other, from the phenomena not being uniform? When we watch the leaping banners of the Aurora Borealis, of which the law is quite unknown, do we straightway invent the solution Will? I think not. We say to each other, Thou art as I am, a thinker; Thou hast as I have, a will; and we say it for reasons even more convincing than the conclusions elsewhere of science. Mr. Spencer has wittily invented this objective illusion of mere lack of uniformity, for the sake of his shining illus-

tration. It is a usual device of commonplace writers to build antagonist giants, which they forthwith knock down again with great applause. Mr. Spencer is not a commonplace writer. He builds an antagonist dwarf, which straightway knocks its maker down.

(138.) Now for the tragedy of self-immolation. This short chapter of eight pages on Will cost more philosophical toil than all the two volumes. The author gets himself into a heat, he runs himself into a corner, and brings himself dangerously to bay. Hear him in his final § 220. 'To reduce the general question to its simplest form: psychical changes either conform to law, or they do not. If they do not conform to law, this work, in common with all other works on the subject, is sheer nonsense; no science of Psychology is possible. If they do conform to law, there cannot be any such thing as free will.' Here we see the horrible alternative. If the assertors of free-will refuse to commit suicide, they must endure the infinitely greater pang of seeing Mr. Spencer hurl himself and his books into that yawning gulf, a sacrifice long devoted, and now by pitiless Fate consigned, to the abysmal gods of nonsense. Then pitch him down, say I. Shall I spare him who tells me that my movements in this orbit of conscious thought and responsibility are under 'parallel

conditions' with those of yon driven moon? Shall I spare him who has juggled me out of my Will, my noblest attribute; who has hocus-pocused me out of my subsisting personality; and then, as a refinement of cruelty, has frightened me out of the rest of my poor wits by forcing me to this terrific alternative, that either the testimony of this Being, this Reason, and this Conscience is one ever-thundering lie, or else he, even he, has talked nonsense? He has talked nonsense. I say it because I have proved it. And every man must of course talk nonsense who begins his philosophy with abstracts in the clouds, instead of building on the witness of his own self-consciousness.

'If they do conform to law,' says our author, 'there cannot be any such thing as free will' The force of this seems to depend on Mr. Spencer's knowledge of 'law.' When I ask, what does this writer know *of* law—definite working law in the Cosmos?—the only answer which I can get is—Nothing, except a very little which he has picked up, often malapropically, as we have seen, among the mathematicians. When I ask—What does he know *about* law? there is neither beginning nor end to the reply. I am advised to read his books *about* law, and to master his differentiations and integrations of the coherences, the correlations, the uniformities, and

universalities, which he has established in the abstract over all space and all time, by his vast experience and miraculous penetration. I have tried to do this, and have found all pretty satisfactory, except the lack of one thing—something like proof of his competence to decide all that scientifically. When I persist in my demand for such proof, it turns out at last to be, that he knows by heart the whole Hymn-book, the Litanies, the Missal, and the Decretals of the Must-be-ite religion! 'Conform to law.' Shall I tell you what he means by that? Exactly ninety-nine hundredths of his meaning under the word *law* is *must-be*.

Our critical professors of deportment will, of course, punish me for this tone of irreverence. Let them first read, with my italics, the following triumphant evolution of consciousness out of the unconscious, in § 179 of his 'Psychology':—

'That an effectual adjustment may be made, they [the separate impressions, or constituent changes of a complex correspondence to be co-ordinated] *must be* brought into relation with each other. But this implies some centre of communication common to them all, through which they severally pass; and as *they cannot* pass through it simultaneously, *they must* pass through it in succession. So that as the external phenomena responded to become greater in

number, and more complicated in kind, the variety and rapidity of the changes to which this common centre of communication is subject *must* increase—there *must result* an unbroken series of those changes—there *must* arise a consciousness.' He knew he could do it, and he did it! What was the evolution of light to this? The next Longinus will put that in before γενέσθω φῶς, καὶ ἐγένετο φῶς.

(139.) In the dilemma before us there is sophism in plenty under his figure, 'conform to law.' I affirm that my will is under law, and yet that my will is free. It is under no law that he can formulate with his pitiful *must-be's*; no law that fastens me, this accountable thinker, to these external cosmic changes. I am a free force among these forces, a conscious cause interfering with these sequences. For the grand new dogma of the Persistence or Conservation of Force I cannot find, and I would thank anybody to show me, half the proof that there is for the Pope's infallibility. A mere list of dogmatising names is poor proof. The law of my will connects me unsearchably with the Infinite, not through these forces which my will alone reveals to me, but in another line, with the Eternal Conscious Cause from whom I spring. I say connects me unsearchably, because I cannot read that connexion up to the Infinite; but honestly and humbly reading in this finite where I stand, I formulate thus to myself, not

without light which comes not from these phenomena, the law of my accountable being: first, I ought, not merely I had best, I ought to do right: secondly, if I choose to do wrong, as I am perfectly at liberty to choose, I must (and when I say to myself I must, I am not pretending to teach others cosmical science), I must face and endure the consequences. No priest, no preacher, can come between me and the justice and mercy of that law, by which either stripes inflicted, or talents taken away, or both at once, will surely be the sequel of sin.

Of Mr. Spencer in person I have not the honour to know anything; of Mr. Spencer as a reasoner, I am sadly disappointed to know so much. In the direct line of my own topic I have spoken of his book; and I think I have made one thing clear, that, although he may be competent for the evolution of a cosmos or two, he is not the man who will help us to lay the foundations of a philosophy without assumptions.

CHAPTER XII.

THE CAUSE, AND MR. JOHN STUART MILL.

(140.) I BEGAN my philosophy with the one datum, 'I am thinking.' With this I begin it in every train of thought. In these pages I am thinking with 'I am' and 'I will' of philosophy, of which a leading impulse is, when dwelling on a confessed truth in a clear proposition, to demand the reason Why. How is this scientifically true to me and to other thinkers—is a question that can be asked without apparent absurdity, even about a proposition such as 'I am,' of which it is impossible for me to frame a doubt. The question is best put in this form: What is the cause of me-the-thinker, the cause both of me and of my thinking? In other words, what is the complete condition, necessary and sufficient, that I be a thinker? I am sure that it is not science to say, I am thinking because I am thinking. I demand the condition logically necessary, the condition which, being withdrawn, I should be no more a thinker, and which,

having been at any previous moment withdrawn, I should then have been no thinker: and also the condition sufficient as well as necessary, the presence of which, without the need of any other condition, determines my being now a thinker To say that there is no such one condition or sum of conditions—that is, to say that I have no cause—I know to be absurd. I see nothing absurd in the question, What is my cause? There may be an absurdity in supposing that I can answer it. That I am alive, is no answer; for to affirm my life, is to affirm, not to account for, my consciousness—that is, my conscious thinking; since none but a thinker can make a proposition. That I was alive, is no answer; for I cannot prove my thinking an hour ago to be the condition either necessary or sufficient for my thinking now. Nor can the answer be the affirmation of any antecedent fact whatever: the condition must be a fact of the present moment. No phenomenon, that is, nothing which I can describe in terms of sensation, time, space and number, can be my sought cause; for there is no scientific proof that a mere phenomenon is the necessary and sufficient condition of any other phenomenon, much less of that which is no phenomenon; and I, the thinker, am certainly no phenomenon to me or to others. To myself, I am

given in consciousness at the outset of all thought, a datum preceding all my knowledge, either of phenomena or of propositions; while by others I am inferred from phenomena.

(141.) It is clear so far what my cause is not: it is neither an antecedent nor a phenomenon. Science is familiar with causes which are neither one nor the other. What is the cause of the movement of the stone which I have released from my fingers? What is the condition necessary and sufficient to account for its going off in just that line, and with velocity continually increasing? We have a scientific answer to that; but it assigns neither an antecedent nor a phenomenon for cause. The cause is what we call a force, acting contemporaneously with the effect perceived by us, and a force which is utterly unmanifested, save by the phenomenal effects which it produces. The force of gravitation is no more a phenomenon than that which stirs the magnetic needle. A phenomenon appears to sense, and can be described by its appearance. 'No force was ever yet directly apparent to human sense. Magnetism is as yet little more than the name of a cause unknown, a word which asks a question, not answers it, as science demands an answer. But gravitation is an answering law known to science, so that she can assign it in a rigorous formula, and can compute the

predicted working of that law from moment to moment, and from point to point, in fractions of seconds and hairbreadths, to hundreds of decimal places. Of the vast number of forces in action around us there is no other force of which we have a right to say that we are in possession of the demonstrated law, in time, and space, and number, besides certain laws which are part of the theory of gravitation. We know, as far as the science of the finite asks to know, the cause of the stone's movement in that selected line; the condition necessary such that, if it ceased to be present in that line, though acting in all others, the stone would not fall; and the sufficient condition such that, if it acted in that line and in no other, the stone would fall and exactly fulfil our predictions.

(142.) This may suffice to show what is meant by a cause in science. I protest against the employment of two words to express the sense which essentially belongs to one. An *efficient cause* is a silly tautology, because an *inefficient cause*, which is a true cause, is a contradiction in terms. The distinction between *efficient causes* and *physical causes*, of which Mr. J. S. Mill finds it convenient to avail himself, is unscientific and misleading. In fact, there are no physical causes known to accurate science which are not efficient. The popular error of calling a mere antecedent, or a mere concomitant circumstance, by

the name of cause, ought not to find a place in the pages of philosophy; for it can serve no honest purpose there.

Before we try to find an answer to the question, What is the cause of me-the-thinker? it will be useful to note the trick which is perpetually played by many who now-a-days call themselves philosophers, for the purpose of degrading the word *cause*. Perhaps the most notorious of all these culprits is Mr. Mill.

(143.) We find in the third book of his 'Logic' the famous Chapter V. headed, 'On the Law of Universal Causation.' How it does lift one up to read that inspiring title! In § 1 we read: 'Of all truths relating to phenomena, the most valuable to us are those which relate to the order of their succession.' This is one of his fundamental theorems. He means the visible and measurable order of succession, which we can observe and 'turn to our advantage.' A list of empirical, and, after all, discontinuous sequences, for the sake of profit, is all that science aspires to form! It was not by the study of empirical succession that we answered the first question of our philosophy without assumptions.

In § 2 we read: 'The notion of cause being the root of the whole theory of Induction, it is indispensable that this idea should, at the very outset of our

enquiry, be, with the utmost practical degree of precision, fixed and determined.' The reader will applaud this good intention to be rigorous and precise. Let me beg him to keep it in mind. Again: 'I premise, then, that when, in the course of this enquiry, I speak of the cause of any phenomenon, I do not mean a cause which is not itself a phenomenon.' . . . . 'Of efficient causes of phenomena, or whether any such causes exist at all, I am not called upon to give an opinion.' . . . . 'The only notion of a cause, which the theory of induction requires, is *such a notion as can be gained from experience.*' That is, I fancy, if any man in Mr. Mill's company had desired to find a cause for the manifestation of seeming intelligence and will presented by him, he was forbidden by the theory of induction to assign as cause a conscious mind in Mr. Mill; for that is no phenomenon, nor can the notion of a consciousness not my own be gained by experience. Again: 'The law of Causation, the recognition of which is the main pillar of inductive science, is but the *familiar truth*, that invariability of succession *is found by observation* to obtain between every fact in nature, and some others which have preceded it.' Again: 'Between the phenomena, then, which exist at any instant, and the phenomena which exist at the succeeding instant, there is an invariable order of succession.' . . . . 'To certain facts,

certain facts *always do*, and, *as we believe*, will continue to succeed. The invariable antecedent is termed the cause; the invariable consequent, the effect. And the universality of the law of Causation consists in this, that every consequent is connected in this manner with some particular antecedent, or set of antecedents.'

(144.) The italics are all my own. It is a wonderful thing that a man who had seen a stone fall had no opinion to give about an efficient cause, nor of any cause save what is both antecedent and phenomenon. Could he never have heard of the force of gravitation, which is nowhere either a phenomenon or an antecedent to the phenomenal effect, whether that effect be motion or repose? But, pass that, and answer me, if you can, this question. What right has Mr. Mill to define the *invariable antecedent* as the *cause*? By whom is it ever termed the cause? By the vulgar, by unscientific people, and sometimes by sound divines. But in a book of rigorous science, we expect something better than the phrases of the unlearned, or even of the orthodox. We expect to see a disinclination to increase the confusion due to inconsistent meanings of leading terms. We look for some respectful regard for the old philosophical sense of such a word as cause. Cause is a term that science cannot spare, and cannot replace. The

science of the finite cannot hope to go deeper into anything in nature than to find the cause, the requisite and sufficient condition. And she is content if she can accurately assign the force or sum of forces, in time, space and number, to which the phenomena are due. For this great study, she must have the use of the terms, cause and causes, which stand neither for antecedents nor phenomena. If Mr. Mill wanted a monosyllable for his invariable, undefined, and (as we shall presently see) utterly undefinable antecedent, why did he not make one? He is talking through the chaos of these sections about nothing in earth or heaven, save empirical and discontinuous sequences; but he wanted a fine word in *-ation* to give dignity and pedigree to his empty chapter; whereupon, from the jewelled zone of venerable Philosophy, he filches the most precious of her seals, that grand old gem, the cause, and stamps his sophistry Causation! It was no abstraction of cleptomania, no mere literary larceny; it was deliberate philosophical felony, not indeed for vulgar lust or greed, but for scientific imposture. The man who, in writing a treatise on Logic, spells and pronounces *antecedent* with the letters and the sound of *cause*, is just as upright in his logic as the man who passes forged half-crowns is in his dealings.

The reader may object, perhaps vigorously, to

this tone. I meekly answer with the unarmed shepherd boy—'Is there not a cause?' 'Who is this uncircumcised Philistine?' 'Thou shalt not steal.'

(145.) Enormous mischief has been done, and is now doing, by the sophistries of Mr. Mill and his school. There is no ground to fear that our Biologists and Evolutionists, by their inane flourishes with the big words Differentiation and Integration, will bring our mathematical theorems and methods into contempt. But the efforts which sham philosophy has made to degrade such terms as Cause and Will, and Power, and Law, have been, among the young and half-learned, but too successful; and after the publication of Mill's 'Three Essays on Religion,' which are just as well meant and well reasoned as this bungling chapter on Causation, one can have no delicacy in assigning the true aim of this disgraceful word-robbery. It was to root out of logic and science the notion of a veritable cause of the Cosmos, and it has culminated in that outpouring of scorn upon the belief of a conscious Author and Upholder of the Universe, the all-perfect God and Father of us all, which stains the morbid pages of those Three Essays. Whether is it more lamentable or more laughable, to see a worm, in revenge for its position among worms, writhing in knots of its own tying and wreaking its wrath upon its maker?

It will be no reply to point out that, in the course of this Chapter V., Mr. Mill eats up his own first principles and definitions. The effect of his opening statements remains the same upon those who cannot make their way—and who can ?—through the muddle of the whole chapter. The following is the passage to which a defender of Mill will probably appeal, in which, with an ill grace, he prepares to withdraw his definition of a cause by phenomenal antecedence :—

§ 6. 'As to the ulterior question, whether it is strictly necessary that the cause, or assemblage of conditions, should precede, by ever so short an instant, the production of an effect (a question raised and argued with much ingenuity by a writer whom I have quoted), the enquiry is of no consequence for our present purpose. There certainly are cases, in which the effect follows without any interval perceptible to our faculties; and when there is an interval, we cannot tell by how many intermediate links, imperceptible to us, that interval may really be filled up. But even granting that an effect may commence simultaneously with its cause, the view I have taken is in no way practically affected. Whether the cause and its effect be necessarily successive or not, the beginning of a phenomenon is what implies a cause, and causation is *the law of the succession* of phenomena. If these *axioms be granted*, we can afford, although I see no

necessity for doing so, to drop the words antecedent and consequent, as applied to cause and effect.'

This means that the writer is content to stand flatly contradicted all round about the definition and nature of a cause, if only you will allow that he is a cosmic lawyer, and has written a brilliant chapter 'On the Law of Universal Causation,' to which he can gravely refer as conclusive in his future books.

(146.) I have called this an empty and a bungling chapter. These epithets must be justified before the sternly scientific reader. What I am here saying, I said in effect and proved it fourteen years ago, in a paper 'On a so-called Theory of Causation,' which may be seen in the Proceedings of the Literary and Philosophical Society of Liverpool for 1861-62, a copy of which I sent at the time to Mr. J. S. Mill; but neither from him nor from any of his admirers have I heard a word of reply. I shall content myself with making a few extracts from that paper (p. 119, &c.) :—

'There is a wonderful resemblance between this "main pillar of science," so far as it has yet been exhibited, and another "familiar truth," which I suppose will hold the same rank in the sciences of position, that the fundamental theorem before us holds in those of succession; namely, that every point in space is invariably next neighbour on the right to some other.

'There are two things which Mr. Mill has to undertake, both far beyond his power: the first is to answer a challenge, the second is to reply to a retort.

'The challenge is this,—If your theorem is worth anything in science, if it can be handled as an instrument of thought, you ought to be able to favour us with some exact application; you can produce at least some one effect A, and clearly pick out and exhibit its phenomenal cause B, defining B precisely in compass and number, in time and place, and in its peculiar relations to A. This challenge he appears to decline, and in all that he has written about it I can see no indications of a capacity to meet it. In § 6 he says: "As to the ulterior question, &c." (already above quoted).

'We now come to the neat retort of Dr. Reid to the sophistries of Hume, that, according to this doctrine, night must be the cause of day, and day of night. Let us see how Mr. Mill deals with it.'

In § 5 he observes:—'When we define the cause of a thing to be "the antecedent which it invariably follows," we do not use the phrase as exactly synonymous with "the antecedent which it has invariably followed in our past experience." Such a mode of conceiving causation would be liable to the objection very plausibly urged by Dr. Reid, namely, that

according to this doctrine, night must be the cause of day; and day the cause of night.' What doctrine? Plainly the doctrine last rebuked, that the cause of a thing is 'the antecedent which it has invariably followed *in our past experience!*' There is error somewhere under the phrase italicised.

Here we must pause to get a clear view of the difference between the right way and the wrong way of conceiving causation. The error is not in the word *experience*: it must be either in the word *past* or in the word *our*. But we have no *future* experience, nor any of which we can give account, to which we can refer, and out of which we can build philosophical theories, except *past* experience. Wherefore the error, the wrong conception, must somehow lurk under the term *our*. To get the right conception, let us go back to what our teacher has before laid down about the matter in the following unbroken quotation from § 2:

'The only notion of a cause, which the theory of induction requires, is *such a notion as can be gained from experience.* The law of causation, the recognition of which is the main pillar of inductive science, is *but the familiar truth,* that invariability of succession is *found by observation to obtain between every fact in nature and some other fact which has preceded it*; independently of all consideration respecting *the*

ultimate mode of production of phenomena, and *of every other* question regarding the nature of "things in themselves."' The italics are mine. Can we be mistaken in gathering from this that we are indebted for our knowledge or our notion of the cause of a thing to *our* experience, and to *our* observation of facts occurring and of facts preceding? I think not, if words in the pages of Logic have any meaning. Mr. Mill cannot mean that we, as philosophers about causation, are bound to rest upon experience in which we have had no share, and which we can never verify.

Now let us look at Mr. Mill in that splendid attitude in which he parries the retort of Dr. Reid. The burning student of Law was just saying to himself after mastering § 2—the cause is the antecedent found by our observation; there can be no mistake. This 'familiar truth' must be so, because we know, know it by *our* experience; and with that formula he proudly felt himself prepared, behind Mr. Mill, to encounter a world in arms. But

> The Master saw the madness rise,
> His glowing cheeks, his ardent eyes;
> And, while he heaven and earth defied,
> Changed his hand and checked his pride.

Presto! Pass! Behold the might of magic! It is now—not must be so, because we know; but we know, because must be so! It is now *not* 'the antecedent which has invariably followed in our past

experience' which we define as the cause of a thing. It is not simple experience, either yours or mine, that you have to study in getting at the true notion of a cause. You require my sublime lesson about *necessity*. And the lesson luminously follows the words last quoted, the lesson about the grand old tortoise whose mustbeity and perseity are at the bottom of the understanding of all sham science. Forgetting his fine disclaimer in the words above cited from § 2, 'independently of all consideration respecting the ultimate mode, &c.' he proceeds exactly thus: 'But it is necessary to our using the word cause, that we should believe not only that the antecedent always has been followed by the consequent, but that so long as the present condition of things endures, it always will be so.' We have laudably changed our tone; from 'but the familiar truth,' and 'found by observation,' to the good Athanasian formula 'It is necessary that we believe.' At the word *things* last quoted, there is an asterisk guiding to this foot-note: 'I mean by this expression, the ultimate laws of nature (whatever they may be), as distinguished from the derivative laws and collocations.' Thus, to my puzzled apprehension, the *ultimate mode* or *laws*, and 'things in themselves,' appear to be essential parts after all of this philosophy of Causation, in spite of the disclaimer.

Lower down in this § 5, we have a display of the familiar wind-bags of great Must-be. 'This is what writers mean when they say that the notion of a cause involves the idea of necessity. If there be any meaning which confessedly belongs to the term necessity, it is *unconditionalness* [i.e. whether-or-noness; in fact, necessariness]: that which is necessary, that which *must* be, means that which *will* be, whatever suppositions we may make in regard to all other things. The succession of day and night, evidently is not necessary in that sense.'

The reader must help himself, for the dish is beyond my carving, to the sense of Mr. Mill's reply to that unfeeling retort of Dr. Reid, as well as to 'what writers mean' by *necessity*. I shall be lucky if I escape the charge of mis-stating what this eminent reasoner has penned. The wisest thing that the student can do is to read this § 5 with the aid of some famous matter-and-must-be doctor. I know of no page, making a pretence to logic, in which the writer twists and writhes in a manner more fearful to behold.

'I hope that this § 5 may be all convincing to somebody: to me it sounds rather like the groans of logic in sore tribulation.' It is the Laocoon of Logic.

(147.) 'I hasten to the *coup de grâce* which the author deals to himself with his own right hand.

Here comes the final definition (p. 372), fourteen pages after the enunciation of the great theorem, which in common books of science it would have preceded: § 5. "We may define, therefore, the cause of a phenomenon to be the antecedent, or the concurrence of antecedents, on which it is invariably and unconditionally consequent." But stop; it is not quite final: the next words are:—"Or if we adopt the convenient modification of the meaning of the word cause, which confines it to the assemblage of positive conditions, without the negative, then, instead of 'unconditionally,' we may say 'subject to no other than negative conditions.'"

'One is thankful to have the author's help to be rid of that difficult negative word, "unconditionally;" whatever comes in its stead can hardly be more indefinite or puzzling to ordinary heads. So we will make the queer substitution which he is good enough to supply, and which, in a fundamental definition of a great theory, most discoverers would have formally made. And now the final definition reads exactly thus:—"We may define, therefore, the cause of a phenomenon to be the antecedent, or the sum of the antecedents, on which it is consequent invariably, and subject to no other than negative conditions." I hope you are enlightened now: the author has taken prodigious pains through this laboured chapter to model and mend his definition for you, and he is not

obliged to find you in philosophical profundity. You feel obliged to him, and a little ashamed of your own dulness; and you modestly confess that—besides the puzzle arising from the addition, in a scientific definition, of a phrase comprising conditions written next after the word invariably—you are really at a loss to know, first, what is exactly meant by the subjection of a thing invariably consequent to only negative conditions; and, secondly, what this invariable thing is; because a choice is offered to you in the definition, with embarrassing liberality. You may choose, for the invariable, either an antecedent, or you may choose a concurrence of antecedents, which may be either antecedent or simultaneous with the effect; and if you choose the latter, you feel a little puzzled to discover whether the secret of causation lies in the mere antecedence, or in the process, operation, or combination or force, denoted by the figure of speech, "concurrence of antecedents." For, when you consider that there are millions of millions of antecedents to every phenomenon A, all alike phenomena, all equidistant in order of time from the phenomenon A, and all, for anything you know, contributing to the phenomenon A, as well as to contemporaneous phenomena, you hope the learned author will not laugh at you much, if you are a little bewildered in trying to ascertain what you have learned about the cause of the fact A.'

(148.) 'Well, fortunately, whatever becomes of your second long-winded difficulty, I can help you in the clearer first; for the author has made that in part pretty plain, at page 336, § 3. His words there are—"The negative conditions of any phenomenon, a special enumeration of which would generally be rather prolix, may be all summed up under one head, namely, the absence of preventing or counteracting causes."

'Nothing can be more deliberate, nothing more precise. All that we have to do, after working at this definition through these fourteen pages, is to make in it the substitution exactly supplied by the author for *negative conditions*. Once more then, the final definition reads thus:—"We may define, therefore, the cause of a phenomenon to be the antecedent or concurrence of antecedents, on which it is consequent invariably, and subject only to the absence of preventing or counteracting causes."

> Jamque opus exegi, quod non Jovis ira, nec igne,
> Nec poterit ferrum, nec edax abolere vetustas!

'Here indeed is a triumph of logic. It turns out that the last word, perhaps the most emphatic word in the definition of *a cause*, is the word *causes*! All these treasures of philosophy are our own, if after laboriously learning how to define a cause, we can

find one little key to unlock the meaning of the word causes!' *Plaudite porcelli!*

(149.) Nothing that I have read of Mr. J. S. Mill's achievements in logical science has altered the opinion which I expressed of his thinking power in the above-quoted paper. It was formed from the study of the sections of his 'Logic' on which he appears chiefly to have prided himself, and to which he refers at the close of his chapter on Sir W. Hamilton's Theory of Causation ('Examination of Sir W. Hamilton's Philosophy'), thus: 'The law of Cause and Effect in its objective aspect, as the fundamental principle in the order of the universe, the basis of most of our knowledge, and the guide of all our actions, has been so fully treated in its numerous bearings in my System of Logic, that it is needless for me to speak further of it here.'

My persuasion is, that Mr. J. S. Mill's only definite notion of a 'fundamental principle in the order of the universe,' or of 'the basis of most of our knowledge,' was Must-be so; I know! A clear determination to lay down and to fight for a wordy dogma passed with him for a clear insight into the difficulties of a question. Of the value of his writings on political and social themes I pronounce no opinion; of his capacity to discourse philosophy I have a very decided one. There is not one chapter

of his large volume on Hamilton's Philosophy in which, along with evident proofs of extensive reading, logical confusion and blundering, not less surprising than what I have above pointed out, cannot be detected. Let any reader ask himself, after carefully reading that volume, What clear additions to my knowledge, besides dogmatism rejected and dogmatism substituted in confusion worse confounded, can I enumerate to myself?—he will find that he has filled his mouth with *-ivity -ality* and *-ation*, and his belly with the east wind.

(150.) It is most amusing to hear Mr. Mill's protest against being called a Must-be-ite. When I rally him with my laughing Must-be-so; you know! —he resents the first charge, and owns the soft impeachment of the second, with regard both to physical and moral causes. There is no need at all for him to eke it out with must-be; because his own knowledge and experience (for this is all he has, for tools of exact thought, of the *experience* which cuts such a figure in his pages) are unconditional and universal foundations. Thus at page 500 of this 'Examination:' 'What experience makes known, is the fact of an invariable sequence between every event and some special combination of antecedent conditions in such sort that wherever, and whenever that union of antecedents exists, the event does not

fail to occur. Any *must* in the case, any necessity, other than the unconditional universality (!) of the fact we know nothing of.' And at page 501: 'A volition is a moral effect, which follows the corresponding moral causes as certainly and invariably as physical effects follow their physical causes. Whether it *must* do so, I acknowledge myself to be entirely ignorant, be the phenomenon moral or physical; and I condemn, accordingly, the word Necessity as applied to either case. All that I know is that it always *does*.' These two extracts give the measure of the man as a scientific thinker. Of course one glance at 'All that I know' swept all necessity out of necessity! He understands the unconditional universality of facts of sequence between events and combinations of conditions. He can analyse the zero, necessity. All that he requires of *must-be*, besides the dead certainty, is the 'unconditionalness,' merely all its meaning, its *mustbeity*. See his words in (146): 'If there be any meaning which confessedly belongs to the term necessity, it is *unconditionalness*.'

The day will come when there shall be in England a public and a press with a reasonable tinge of logic in their complexions. When they compare the philosophic fame of J. S. Mill with his writings, they are likely enough to ask—How is it that the genera-

tion of editors and reviewers, which glorified him as the leading thinker of Europe in his day, omitted to give him the command of the Channel Fleet? All English Liberalism insisting upon that would have been quite as logical as their loud admiration of his philosophical profundity.

(151.) I now proceed with my attempt to find an answer to our question of cause—What is the condition, or sum of conditions, requisite and sufficient that I be a thinker? I am in search of a scientific answer—by which I mean one free from unproved assumptions and sophisms, and deduced from the observed forces and order of the Cosmos, the laws of nature, as we call them. This is soon disposed of.

Professor Tyndall informs me not very luminously in his speech of autumn 1874 at Belfast, that I have been developed 'by the operation of an insoluble mystery.' I presume that he means to announce his discovery that it is beyond the competence of man to work out the evolution of any mind, or of any individual consciousness. How could he say this, when Mr. Herbert Spencer in § 179 of his 'Psychology and Biology,' has actually worked out the evolution, the first, the protistoplastological evolution of all consciousness, out of the primary inert unconscious pulp? He has bridged the gulf between the unconscious and the conscious with six *must-be's* and

one little typographical dash. Such knowledge was not too wonderful nor excellent for him. *Sic itur ad astra.* He hauled himself up, like the Baron renowned, by his own hair!

Professor Tyndall does not pronounce that such evolution is absolutely impossible to all finite intellect. Let us suppose that the archangel Gabriel had scientifically evolved himself and completely thought out the cause of himself-the-thinker, so that he could write down the whole demonstration in terms of the finite up to a certain moment of his being, accounting philosophically for himself by his knowledge of cosmic laws and forces. The train of thought, fully written out, would begin at a certain time *t*, at which he might choose to repeat the whole train, with this proposition—At the time *t* I was the conscious thinker Gabriel; and it would, if the logic about preceding facts and processes was rigorous all through, end with *Ergo*, at the time *t* I was the conscious thinker Gabriel. It would be a donkey's circle. The final proposition would be true enough, perfectly true; but the *Ergo* would be a falsehood. For from A=B, if we deduce by any reasoning, however cunning, *Ergo* A=B, the *Ergo* is a falsehood; for it affirms that to be deduced logically from the first proposition which is viciously deduced, as the logicians say, or that to be reasoning which is not reasoning.

That this absurdity and impossibility must be attached to all attempts of mine to deduce or evolve myself by my science, will not be denied by anyone who is satisfied of the truth of the proposition laid down in (11). Nor can I apprehend that such a one will shrink from affirming that the standing order, there fixed for his philosophy and mine, is fixed for every finite thinker in the universe. 'I am,' which is the first proposition of every train of reasoned thought, and out of which (11) the whole demonstration must logically flow, can never be the final proposition of the train but at the expense of all sense and logic.

(152.) Suppose next that Gabriel had satisfied himself that he had worked out by his philosophy, without any help from our earthly evolutionists and protoplastologists, a scientific deduction of me-the-thinker; that is, that he had found the answer to our question about my cause, by his insight into the laws and forces of the Cosmos. The train of reasoning would begin with—I Gabriel am a conscious thinker; and it would, if all written down, end with—*Ergo*, this poor human being is a conscious thinker. It would be no formally vicious circle. There is, I hope, no absurdity in supposing that by some means, in this world or in the next, the demonstration might be laid before me, and that with sufficient instruction

and application I might come to understand the arguments. One thing would be absolutely necessary, before it could become *my* complete train of reasoned and written thought. I should have to head it with the proposition in (11), and to alter the conclusion into —*Ergo*, I am a conscious thinker. It matters not a straw now whether I be able to comprehend the demonstration or not. A glance at the beginning and end would justify me in tossing it aside as a heap of sophistry, a mere donkey's circle. My instructor might be shocked, and might ask me how I could presume thus to contemn the learning of an archangel. I would boldly reply, that one flaw in logic is to me sufficient to evacuate the authority in finite science of a thousand Gabriels, had they even covered the whole firmament with closely-written demonstrations in working out their deep evolution of me-the-thinker. I will never allow that a train of reasoning can be sound science, of which I can prove that it can be presented to my faculties only in the form of a flagrant falsehood.

(153.) Suppose next that Gabriel, by his philosophy of the finite, had worked out the evolution, not of me-the-thinker of to-day, but of me-the-conscious-infant of two days' old, without troubling himself with the investigation of my subsequent growth and development into this sad sinner of a doubter and

questioner. Suppose, again—I am here speaking but by the permission of an opponent; for no end of sophistry is every day administered to the confiding reader under this polite request—*to suppose.* My advice to him is, stiffly to refuse to *suppose*, for the convenience of a disputant, without proof that the supposition insinuated is a possible step, and free from *petitio principii* and other absurdities. But I really see no harm in begging the reader to suppose, as he has kindly done already, that the reasoning of Gabriel came somehow to be known to our Biologists —they do come to know very marvellous things— and that I were favoured with a sight of it, and with their powerful help to understand the evolution of that noisy phenomenon.

Nobody can deny that I could, without unproved assumption and according to hypothesis, establish by sufficient evidence a continuity of personality from that baby up to Me-the-thinker. Now the logic of Gabriel, thus completed by me, would be as sound an evolution of myself of to-day, as of the said infant of long ago. I should therefore have all the valid reason above assigned for rejecting its account of the causation of the child as all sophistry and nonsense. Whether I could point out the exact blunders or not, it would be all circular logic, fit only to be laughed at by everyone who calls himself a thinker.

I have no means of comparing the interval in the scale of being between Gabriel and myself of two days old with that between one of our mechanical Biologists and an aphis or an amœba. Many of these thinkers are persuaded that their matter-and-must-be science will one day master the evolution of the aphis, and assign its cause as completely as gravitation assigns that of familiar motions. I will not undertake to demonstrate the absurdity of their persuasion by reducing its logic to a vicious circle, because I have no right to ask the reader to suppose that the aphis might become, by further continuous evolution, a reasoning thinker, with evidence of his past development. But if the reader chooses to make that supposition, he will have in his hands the same demonstration of the nonsense talked by the Biologist, which I have above given unanswerably of the absurdities of the supposed speculations of Gabriel about the causation of me. And that, methinks, is something, if we call to mind that a true deduction of science remains true for ever, whatever changes be imagined in conditions that do not alter those on which the deduction is reasoned out.

(154.) We have thus established it as a certainty of science, that to expound from his knowledge of the forces and laws of nature the cause, and thus to work out the evolution, of himself or another thinker—

and may I not add of any other conscious being?—is not only too difficult by reason of inscrutable mystery, but a thing logically and absolutely impossible, for every finite mind.

From this it follows that it is absolutely impossible for any finite thinker to assign by his science the time t, when either he or any other thinker A began to be a conscious being.

For what is required for a scientific determination of such beginning t of an individual consciousness? Neither more nor less than this: that before the time t the conditions necessary and sufficient for the dimmest incipient consciousness of A shall be proved not to have existed, and that at the moment t and ever since they be proved to have been in existence. For this proof it is necessary that the demonstrator, whether A or another, should be in possession of those conditions, that is, of the scientific evolution of the thinker A; and this possession we have proved to be an impossibility to every finite intellect. Whence it follows that the determination, here spoken of of the time t, is an impossibility to every finite thinker.

From the same reasoning it follows that it is absolutely impossible for any finite thinker to assign scientifically, either the time T at which, or the cosmical condition C under which, either he or any other thinker A shall cease to be a conscious being.

For the time T cannot be predicted except by one to whom is scientifically known the sum of conditions necessary and sufficient that A shall retain the dimmest consciousness ; since only in the absence of one or more of these conditions can the consciousness of A be extinguished. This absence is the condition C, the knowledge of which may or may not include that of the time T, although the knowledge of T implies that of C. But we have proved it impossible for any finite thinker to work out that sum of conditions, the cause or evolution, either of himself or of any other thinker A, at any period of A's development as a conscious being.

(155.) This disposes at once of the bragging pretensions of our materialist sages to the knowledge that I-the-thinker shall cease to be conscious when this body is dissolved. It would be easy, by a slight change of terms, to prove the absurdity of their pretences to predict that I shall cease to be a thinker after the dissolution of this frame. All their boasted insight into my thought or consciousness is reducible to a vicious circle, a confutation against which they will vainly pooh-pooh and preach for ever.

The reader will be careful to note that it is A the thinker, not the phenomenal A presented in space by measurable force, of whose evolution we have been discoursing. It is usual to speak of our birth

as the beginning of our conscious being. But we are most of us agreed that we had *in utero* both a passive and an active consciousness. Thinkers we were not; nor until after a certain duration of the life which we are now living. We had no command of symbols by which the trains of thought can be fixed, remembered and repeated. But that 'I am' and 'I will' were there in sensation and in voluntary movement, few of us are likely to call in question. Such trains of thought as we had occupied a time, it may be inconceivably short, and perished. But consciousness and will were there.

In affirming 'I am' as the starting-point at this moment of philosophical thought, I am not bound to give any account, nor to trouble myself about any other man's account, of my previous development as a thinker. Into that history, or the history of my body, I can go only from this 'I am' at this moment; and to this 'I am' every argument of an opponent, and every proof of science, must commend itself now in Me-the-thinker.

I have no theories, nor even guesses to offer, concerning the length of past time during which I may have been in continuous development as a conscious being. The fact, that in this state I am informed of a previous existence at a lower stage of consciousness which I do not remember, is some ground for the belief that I shall be able, in a higher

stage, to look back on this improved condition, not only with more accurate information, but with some better remembrance of this, and it may be even of earlier conditions.

(156.) None of our philosophers can draw, even among objects of sensible magnitude, much less in the unfathomable vast of the minute insensible, an accurate line between the two departments into which they divide the Cosmos, of the conscious and the unconscious; nor can they prove that the latter exists. Be the minimum force-locus a solid atom, or a point without parts, they have no means of determining whether or no a certain finite 'I am, and I will,' sits there along with that marvellous energy and precision, nor whether it be or no capable of training.[1]

As on the graduated scale from zero upwards there are as many distinct divisions between unity and nothing as between unity and infinite, namely, for every number A, whole or fractional above unity, its definite reciprocal A^{-1} clearly assignable below unity—so, if I call my degree of consciousness unity, there may be existing as many different degrees below my own, as above it up to the most exalted mind. About the existence or number of such inferior degrees of consciousness I have no opinion, much less any theory, to offer. The point to which

[1] See Mott, 'On the Meaning o the Word Force;' Proc. Liverp. L.P.S.: 1870–1.

I invite attention is, that the partition of the Cosmos into two departments of conscious and unconscious is the vaguest of word-wisdom, from which all definition and verification are wanting. On this and on other subjects in the first pages of our manuals of philosophy, a good doubter will greet with an indulgent smile the briskness and precision of the twain, Must be so! and We know!—the ubiquitous beadles of the temple of fashionable science.

I-the-thinker am somehow connected with me-the-phenomenon found in space. But to the question —*Where* am I-the-thinker?—I can give no answer. I can no more prove that I-the-thinker have defined location inside this body, than inside the stone cross on my chancel. Thus the first and surest fact that I know, this 'I am,' out of which all my science of space and motion flows, cannot be defined in space; nor can the Ego be proved to have at all the attribute called *extension*. To the reasonable enquiry—*Where* am I-the-thinker?—the only answer not evidently nonsense which I can give is—In God I live, and move, and have my being. But that is no proposition in the science of the finite. The first and most fertile of all certainties is one which neither experience nor science ever taught me. Nor will I suffer this certainty to be nicknamed *metaphysic*. It is *prophysic*,

antecedent in time and truth and order to all my physical knowledge, not coming after it.

(157.) The demonstration of the incompetence of science to give any account of my beginning as a conscious being would have little value, being only a confession of ignorance on all sides, if it were not that it helps me to judge at first sight, without constructing a formal demonstration, of the pretensions of our materialist philosophers to know all about the end of my conscious being. They can demonstrate, forsooth, by their vivisections and horrible carvings of the brains of living animals, that after the dissolution of this body I shall be neither a thinker nor a conscious being. When they are able to tell me something scientific about the beginning of my conscious thought, I may listen—if not with less incredulity, yet, perhaps, with less contempt—to their dogmatising about my end.

We have demonstrated the utter incompetence of the science of the finite to attempt any answer to the question—What is the cause of me-the-thinker? And it would be a strange thing if the science which never taught me, nor was competent to teach me, *that* I am, were able to tell me the reason *why* I am.

As I cannot possibly think out my answer along any line in the finite, even though I had an arch-

angel's intellect, I must seek it outside the finite. In terms of the finite the answer can never be constructed. It must, therefore, contain the Infinite. As the answer cannot be scientific, it must be, like my first datum 'I am,' superscientific. Others may content themselves with the—Must be so! We know!—of a more pretentious, or with the—Inscrutable mystery! Nobody knows!—of a less pretentious, school of philosophers. I shall not rest satisfied either with sham thought or with no thought.

I live, I think, I know, I work, I love; and there is a Cause out of which all this springs. Through the Infinite I cannot think; but upwards, still upwards, towards it my soul can soar, scorning the finite. That Infinite, scientifically, I cannot know; but the Infinite is my Cause. Believing and adoring, I affirm Him with a boldness and conviction surpassing all that I can feel or utter on my themes of finite science. My Cause lives—the Infinite Life! My Cause thinks and knows and works—the Infinite Intuition, Counsel, and Energy, works in the full harmony of victorious science in every point and line of force, in every throb of consciousness, never absent nor forgetting, never pausing nor weary. And my Cause loves—the Infinite Love! He loves all that He has made, to be gladdened and spurred and

trained, through weal and woe, from lower to higher, from darker to brighter, from worse to better. Glorying in all the minuteness as in all the majesty of His designs, 'My Father worketh hitherto'—

> From seeming evil still educing good,
> And better thence again, and better still,
> In infinite progression. But I lose
> Myself in Him, in light ineffable!
> Come, then, expressive Silence, muse His praise.

(158.) I may be pardoned if in the preceding section I have anticipated the answer to one question more which I have to ask about the Cause. What is the cause of the forces which I find acting around me in the Cosmos? True science has always declined to attempt to answer this (71). The disciples of false science are full of light about it, with their matter-and-must-be theories. They are at present both rich and proud by reason of the legacy of Mr. Mill, in his 'Three Essays.' At pp. 150-1, he bequeaths to them the guarantee of his extensive experience, that matter and force, 'so far as experience discloses,' are uncaused and eternal, 'which cannot be said of mind.'

Scientific answer to the question there is none. I cannot better state my way of coming at a super-scientific solution than by one more extract from the dialogue which I have quoted before (17, 72):—

B. 'Let me ask one question more. Have you formed any clear notion what these *forces*, of whose constant presence and action you are convinced, really are in themselves?

A. 'Your enquiry is to me a very solemn one. What these dread forces are, I know not for certain. But I will confess to you what, every moment that I live under their untiring, unchanging, and beneficent teaching, they more and more appear to me to be. I meet them not, I have never met them, nor have been able to conceive them, but under one form, as equivalents or multiples of my own will-force. These forces never clearly speak to me, nor verify themselves to my intellect, but at the challenge of my wakeful, active will. If I had never put forth the question of my will, I should never have been able to conceive of their action as either real or possible. They play with the sportive child; they wrestle, like the veiled Seraph of Peniel, with the strenuous man; but by neither are they observed or remembered as acting, except as equivalents of will: yet every encounter of the will of either with them leaves him richer in the lore of exquisite science, and gifted with a bolder prophetic power. Now, if the child, when he becomes a man, should ask himself—What are those wondrous workings? may he not be pardoned if, despising the dogmas of mock science, and rea-

soning only from what he knows, he compares these energies with the only force of which he is master, his own will-force? If this balances them here, overcomes them there, and wherever it yields to them, in lessons that are safe and profitable, can measure them on its own scale with unerring accuracy, and predict them from its own experience; and, what is more, can combine itself with them in ways innumerable into one homogeneous and foretold result—is he to be blamed for superstition and unphilosophical spirit if he says—What can balance will but will? What can be measured by will but will? What can combine and harmonise with will but will? What can have equivalence and real relation in thought and act to will but will? When a man has dared to doubt, and, doubting, to think boldly up to this point, you might as well beseech this stone, falling freely, not to rush towards the earth's centre, as try to prevent that soul from bursting out, like the smitten unbeliever of Bethel—"Surely God is in this place, and I knew it not!" I glory in believing that all these forces are manifestations of the conscious present working will of the God in whom I live, and move, and have my being. F-O-R-C-E spells WILL!

B. 'Ah! it will be long before the eyes of men can bear the splendour of thoughts like these.

They cry out for the smoked glass of the materialist; they crowd with the unbelieving priest into his *camera obscura* of miracle and mystery, and beg him to feast their darkened eyes once more with the magnified grotesques of their childhood. And if you try to tell them the inspiring truth, the Atheist cries out, "Anthropomorphism!" whereupon a number of the knowing ones reply, "Ha! ha! Anthropomorphism!" and, pleased with that long word, they find themselves philosophers.

A. 'Yes, truly; anthropomorphism is next akin to anthropophagy! It is unscientific to anthropomorphise. We are forbidden to imagine behind the mysterious veil of phenomena the presence and action of what has kindred with our own consciousness. And yet it is perfectly philosophical—nay, it is my bounden duty, when that queer bundle of phenomena which I call Atheist is before me, to conceive that I am verily in the presence of an invisible thinker, of a mind very like my own, but differing from mine by its superior wisdom. But, in the name of all proportion and modesty, have I not ten thousand million times more pregnant evidence, in this daily course of life and mercy, and in all these convincing voices within and without me, that the Living God is here in the plenitude of love and wisdom, than I have that, inside that incongruous

heap and patchwork of appearances, yclept Atheist, there is a mind and conscience like my own ?'

(159.) I shall not guarantee the demonstrative value of the remarks of A and B. Let them go for what they are worth. Their solution of our question does not pretend to be the utterance of science. Science is silent here, and points us onward to Faith.

It may gratify some of my readers to be informed that it is quite easy to fasten upon A the charge of superstition which he deprecates; quite easy to say —Ah! this is the cosmology of the primitive savage, the wretched fetichism which the lights of science have dissipated long ago. Are we to go back to the point of view of the terrified biped brutes, to whom every new form or new manifestation of force was another frightful will, another living power to be worshipped with frantic fear, and appeased with horrible sacrifices ? Something like that, with plenty of fetich and savage in it, is sure to be convincing. The same savage was prone to chew his victuals, and to crack his nuts; but to hear of that does not make me ashamed of mastication, nor eager to swallow matter-and-must-be dogmas whole. That ancient error lay in the inference, not of a will, but of a will capricious and amenable to priestcraft.

I shall not detain the philosophical reader with the enquiry how far the above solution of our ques-

tion about the cause of the cosmic forces is agreeable to the Law of Parcimony, as it has been called.

(160.) It is open to anyone, who thinks it may be profitable, to ask—How many wills are we to conceive at work around us? Something that is done I know to be due to my will, and not a little to the wills of other men; but we are soon tired, while the forces of the Cosmos know no fatigue. Yet, in our small sphere, we are all demiurges. The marks are deep of human Will and Progress. I see nothing absurd in the conception of demiurges of immeasurably greater energy than ours, if that energy be subordinate, not antagonistic, as in many ancient speculations, to the Supreme, and be a continuous and regulated energy. No diminution to the evidence or to the majesty of One Eternal Will and Cause can arise from the multiplication of such demiurges. The loftiest finite power, when he asks, What is my cause? will, if he objects to fall down and worship Must-be, and to career round a donkey's circle, be compelled to answer, as I do, 'In God I live, and move, and have my being.' And it cannot be denied that the invention of demiurges, who, for the good of themselves and their peers, were deputed to do something in the arrangement of the forces at work in this little planet, may be useful against the

attacks upon Theism from certain quarters. The Positivist Littré conceives that, by pointing to hydrophobia and entozoa, he has upset the arguments in favour of beneficent design. Why should not things like these be blunders or oversights of a demiurge? I am a cause and a force in the Cosmos, to whom some things that are to be regretted are justly to be attributed, without destruction of the theistic arguments, or of the character of the Supreme Cause. And there are many things which we should be glad to lay upon an author of finite power and wisdom. There are the tsetse fly, and the locusts, and the Colorado beetle, and other direly mischievous activities; while there are others which, if not simply mischievous, are grievously out of harmony, to our limited view, with logical perfection—such as Vaticanist Flamens and matter-and-must-be Cosmogoners and Biologists. These are all suspiciously like miscalculations and failures of a demiurge.

I am content, at my present stage of knowledge, to believe with Paul in 'One God the Father, of whom are all things, and we in Him,' and to know no more than he did about the 'gods many and lords many,' whose subordinate existence he affirms, and who, doubtless, have all their work to do, and most of them do their best in the Cosmos. The only chance we have of accurate information

on this subject is that the President of the British Association may, before he dies, have another of his prolonged visions of powers and potencies across the boundary of experience, and may be permitted to tell us, with that candid honesty which he carries with him through all his remarkable revelations, what it is that his gifted eyes 'discern.'

(161.) On the great question of the existence of evil in the Cosmos of a good and almighty Creator, I am not competent to discourse. I feel pretty safe in saying what I know of evil really witnessed and experienced by me; but I am afraid of error and sophism if I try to make propositions about the good and evil that happens, has happened, and will happen to the whole human race. I had rather not display my wisdom in estimating what small fraction of the whole duration of a planet, from the first collapse of the gaseous ring out of which it was rolled, ought, by a creator or demiurge of attainments fit to satisfy me, to be devoted to the growth and progress of a race of rational beings. We have philosophers who know enough of the subject for their demonstrations that the grand problem, of combining uniformity with free progress, and proper provision with sufficient spur of incentive and difficulty, has been solved in a very bungling fashion in the history of mankind.

I can say of the evil that I have suffered and witnessed, that the greatest part was preventible, and that such evil will, like a vast amount that has already disappeared, be prevented whenever the dwellers of the planet think it worth their while to set about preventing it. Evil has happened to me which I have richly deserved. Some has happened which I think I have not merited, and my loss has been a gain to others. Against that I have to put advantages which I do not pretend to have deserved, and gain to me out of the loss and suffering of others. To say nothing of animals, how many brave soldiers and sailors, how many colliers and *hands* of shop or factory, how many strugglers in the useful competition for something more than bare bread, have suffered, and do suffer, in order that I may enjoy my daily peace and comforts?—have suffered, I say, not have died; for death is the impartial levy upon all.

(162.) The arguments of the antitheist philosophers against the Love, Wisdom, and Power of God from the existence of evil have all the vice of proving too much. They would lose nothing of their logic if the evil was a little less, and again a little less. They would, before exact science, abate nothing of their force, but would remain equally unanswerable, if there were no evil in the Cosmos

but the thorns upon the rose. I am bound to give a fair sample of the strong-scented wisdom of these philosophers.

At p. 192 of the 'Three Essays' of J. S. Mill we read: 'If the motive of the Deity for creating sentient beings was the happiness of the beings he created, his purposes, in our corner of the universe at least, must be pronounced, taking past ages and all countries and races into account, to have been, thus far, an ignominious failure. . . . . If man had not the power, by the exercise of his own energies, for the improvement of himself and of his outward circumstances, to do for himself and for other creatures vastly more than God in the first instance did, the Being who called him into existence would deserve something very different from thanks at his hands.'

This is said without reserve, or subsequent qualification; to an imperfect hint of an obvious reply he rejoins, as we shall see, that it only makes matters worse. The above is a specimen of philosophizing about man in the abstract, man in general, 'taking past ages, and all countries and races into account,' a calculation perfectly easy to such a brilliant accountant. These sages love to shine in grandly general and abstract propositions. But no such proposition is worth a straw in science, unless it will stand the test of some application to the concrete and particu-

lar. Few of them ever dream of that in their discoveries of universal theorems. Let me beg the reader of the last-quoted sentence to put, for 'If man,' 'If the man A,' and to read it without any other change. Has it either the sound or the savour of truth? I will not pretend to prove that there never was a man A, in whose mouth such remarks about his Maker and himself would be sense both reasonable and just. But I say that, if there never was such a particular man A, the fine generality of our logician is ignorant nonsense. I say more: if Mr. Mill was not well informed of such a particular man A, the whole sentence is ignorant, arrogant, and most impudent nonsense. What says this posthumous page?—

> Oh! my offence is rank: it smells to heaven!

The next words are—'Of course it may be said that this very capacity for improving himself and the world was given to him by God, and that the change which he will thereby be enabled to effect in human existence will be worth purchasing by the sufferings and wasted lives of entire geological periods. This may be so, but to suppose that God could not have given him these blessings at a less frightful cost, is to make very strange suppositions upon the Deity. It is to suppose that God could not in the first instance create anything better than

a Bosjesman or an Andaman islander, or something lower still, and yet was able to endow the Bosjesman or Andaman islander with the power of raising himself into a Newton or a Fénelon.' I leave the reader to amuse himself by translating the abstract man into the concrete here, and by finding out whose supposition this great logician is expounding, and to admire the exposition. To help him in making out the writer's notion, I give one word more, which I candidly and cheerfully grant is not too much for such a mouth to say.

At page 177 we read : 'It is not too much to say that every indication of design in the Cosmos is so much evidence against the omnipotence of the designer. For what is meant by design ? Contrivance, the adaptation of means to an end. But the necessity of employing contrivance, the need of employing means, is a consequence of the limit of power. Who would have recourse to means, if to attain his end his mere word was sufficient ?'

Mr. Mill does not say that it is inconsistent with omnipotence to intend something which shall have a beginning, a middle, and an end, in time, with steps of action and progress intervening. All he says is that, if the designer does not begin at the end instead of the beginning, he forfeits his omnipotence. He does not refuse to omnipotence his permission to plan

a race of progressive rational beings that shall pass through gradations from a Bosjesman up to a Newton, each individual tasting for a time on earth of precious life, and preparing for something better hereafter ; but if, in execution, the designer does not start at the Newton first, he must submit, as a feeble blunderer, to be confounded and exposed to shame by John Stuart Mill!

(163.) I consider every man to be a Theist who believes that there is a Conscious Intelligent Cause and Upholder of all the Universe of Being. It is a remarkable thing that there are some good, loving and religious men who resent indignantly the imputation of Atheism, and refuse to confess that belief of Theism. One man will tell you, 'I believe in a God, but not in a personal God,' and he will say not a word more. If you ask him, 'Do you believe in a Ruler who does not know that He is ruling; in a Worker who does not know that He is working; in a Giver and Lover who does not know that He is giving and loving?'—you will get no reply; because your friend, who is not much given to close and logical thought, is persuaded that you are about to entrap him into the affirmation of a personal God, which to his mind carries something of form and limit with it. Another will tell you that he finds no evidence that there is a God; but he

will lift his eyes and hands to heaven, and in a tone of most religious awe and reverence, will declare his conviction that there is a Power, a Power, a Power! In vain do you ask him what he means by a Power, or how he comes, without touching consciousness and will, at the notion or evidence of a Power (105). He will tell you that he objects to metaphysical trifling; and you find that he has convinced himself that the sum and the substance of all the logic and philosophy that can be either reasoned out or uttered on the topic is this—there is not a God, but there is a Power! The truth is that these good men are not Matter-and-must-be-ites; they are thinkers and believers, whose tongues are ever struggling against the utterances of their inmost souls, and who are unaccustomed to demand from themselves a logical account of the words they employ. They resent bitterly the contradictions which were forced down their throats in their youth by their churches. They shun, with a feeling of disgust, the terms of those early lessons, and prefer even the phrases of Atheism, while believing and adoring in their hearts.

The Churches may thank themselves for the whole crop of Materialism and Atheism which, far and near, is darkening all our fields. As they have sown, so must they reap. Atheism is the shadow

of sacerdotalism. The more brightly God's sun is shining, the more sharply is that dark double defined.

The question—Is God a person? is of as much philosophic value as the question—Is Infinite odd or even? Leave the pedigree and the prestige of the word *person* to the theological sectaries. The Omnipotent, Omniscient, Omnipresent Father of us all can be worshipped in spirit and in truth, without the help of words in *-ality*.[1]

[1] Vide Appendix to this Section.

CHAPTER XIII.

LAW, AND THE MATTER-AND-MUST-BE COSMOGONERS AND BIOLOGISTS.

(164.) THE grand secret of sham science whereby the Cosmos is to be simplified, and her own wisdom magnified, lies in the degradation of the noblest terms of philosophy. Cause, Will, Power, Law—these have all to be degraded. The doctors have won most glory by this treatment of Law. It is a deep religious conviction of all who meditate on the works and providence of the Living God, that there is scientific law and method in all the manifestations of His Power and Wisdom, and this alike in small things as in great. There is majesty in human law, and we justly pay reverence to the learned who are masters of certain departments of the law of England. It may be that the wisest of them does not know it thoroughly in every branch; but we have no doubt that it is all known. The legal knowledge of the learned is co-extensive with the whole field of existing ordinance and legislation. Unspeakably greater is the majesty of the whole Law of Nature, as it is

termed, the law of God's ever-working Will; for we believe that this is so perfect in its provisions for every possible case or combination that it requires no new or supplementary legislation, no Acts to repeal or to amend Acts on any emergencies. And when our souls are full of awe before this majesty, and of abasement from our own ignorance, we are easily convinced that the philosophers know vastly more than we; so that when our Huxleys come forward to instruct us with their 'fact I know, and law I know,' we are in the mood to pay them even larger reverence than that which we render to the learned in England's law.

John Stuart Mill is great upon Law. At page 5 of his 'Three Essays' he writes: 'Since the phenomena which a thing exhibits, however much they may vary in different circumstances, are always the same in the same circumstances, they admit of being described in general forms of words, which are called the laws of the thing's nature. Thus it is a law of the nature of water that, under the mean pressure of the atmosphere at the level of the sea, it boils at 212 Fahr.'

Thus he is learned in the law of the nature of water. When you consult a good lawyer about the law of the nature of a will, and learn from him that if a certain fact A occurs, another fact B takes place

by law at the same moment, you will find that he will be able to teach much more than the coincidences of the two isolated facts A and B. If you question him about facts A_1, A_2, A_3, &c., leading up to A, or consequent on A, he will enlighten you concerning the variations by law of the fact B into B_1, B_2, B_3, &c.; and his knowledge of the way in which A_1, A_2, A_3 . . . B_1, B_2, B_3 . . . are connected in either group or dependent by law, term on related term in the different groups, will be wonderfully more extensive and accurate than your own. He will be able to discuss the whole ground about the case from point to point, and from moment to moment, and you will get for every clear question of varying conditions a clear and lawyer-like reply.

Imagine one of these philosophers who are so learned in the laws of the nature of things, coming in to tea, and showing you his knowledge of the nature of water. The kettle is on the fire; you know already that it will boil if let alone; although you never thought of calling that quite a knowledge, to be stated in a general form of words, of the law of the fluid's nature. He can tell you such a law, and he predicts with success, that if you put a thermometer into the water the mercury will stand at 212 Fahr. when it boils, and will remain there while it is boiling. But if you ask him what is going on in

the substance of the water, or of the mercury, during three seconds preceding or succeeding the moment of boiling, you will find that he knows about that just as much as the kettle. He found out what he lays down as law, not by any anticipation or deduction of scientific thought, but purely by accident. Give him a new fluid—some oil or acid unknown to men or angels. In a trice he will be prophetically deep in the law of the nature of the substance, remaining as ignorant as before of all connexion between the fact of the moment and that of the preceding or following, for any point or atom of the substance. You may, in return, thus teach him. Take an empty pint pot P; be sure it is exactly a pint, neither more nor less. Place P on level ground in any latitude or longitude, and drop a pebble into it. Take another pint pot Q, a mathematically true pint, mind you, and fill it with water. Now pour the water out of Q carefully into P; and, before you have quite done it, you will see the earth about P suddenly glisten and change colour. That is one of the laws of the nature both of earth and of water. It is a far more profound and scientific bit of law than the philosopher's about 212 Fahr., because you can predict the phenomena leading up to the sudden moistening of the earth in the trickling of the water down the sides of P, as well as assign a reason for the flow; and the knowledge which we

have of the law of gravitation, which governs the movement of the water, enables us to predict both in time and place to the millionth part of an inch and of a second. The philosopher is in possession of no law, nor of the faintest conception of any law, which governs the interior movement on which his facts depend, either of the water or of the mercury; nor can he construct a scientific expression 'in general forms of words,' however far he may carry his empiric measurements of the observed results of rising temperature. He knows nothing fit to be called a law of the special nature either of water or of mercury.

I protest against this degradation of the word Law. When a man has learned empirically an isolated sequence or coincidence of phenomena which is found to recur again and again, he has no right to pretend that he has mastered a law. If he knew the law of the changes going on before him, he would be able to cover a certain breadth of neighbouring time and space around the fact, from point to point, and from moment to moment, with accurate calculation, either of past or coming change, as we can do this with regard to the changes due to the known law of gravitation.

(165) In his famous 'Address' August 1874, at Belfast, page 29, the President of the British Associa-

tion spoke as follows :—'Abandoning all disguise, the confession that I make before you is, that I prolong the vision backward across the boundary of the experimental evidence, and discern in that Matter which we in our ignorance, and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium, the promise and the potency of every form and quality of life.' . . . 'All religious theories, schemes and systems, which embrace notions of cosmogony, or which otherwise reach into its domain, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it.'

These words, and many more in the oration, may be expounded in more senses than one. What Professor Tyndall privately understood by them is neither known nor asked by me.

I am not about to comment on this tall talk as uttered in earnest by him, but as words too plainly understood in earnest by an applauding crowd of hearers, editors, and readers, vastly his inferiors in mental power. He knows that it would be a very stupid thing to speak seriously of the control of science over the field even of demonstrated truth. What is the sense, and what is the need, of affirming such control over the multiplication table? And to prate of compelled submission to the control of

science over thoughts touching or reaching into the domain of cosmogony, in which not a single scientific question has yet been asked, much less answered, is oratory at the boiling point of nonsense. Professor Tyndall knows that. Yet this is all good sectarian sense, if for the control of 'Science' you put the control of 'the Church.' Science here stands for that good old word Church, the church of the Mustbeites. And 'Church,' when brought forward as threatening authority in debate, means always and on every side just this and nothing more—myself, and those who go along with me in our essentials. Professor Tyndall himself believed what he said, exactly as Dr. Manning did, when some two or three years ago, according to the reports in admiring papers, he sung out in his own person to my bishop and me from one of his pulpits, 'Were you ever in antiquity, or any that belong to you? I was there.' The President of the British Association chose to show us that he too could blow a blast on that old clarion of hectoring orthodoxy, and that, like a common cardinal or metropolitan, he could put on the grimaces of the hierophant and mystagogue.

This rant of sectarian bounce and mischief must go on on all sides so long as Ignorance is king. I may succeed, perhaps, in saying something that in

the minds of those who love to think a little may diminish the mischief.

I say, then, that the wisdom of these Matter-and-must-be doctors is over-rated considerably by themselves, and most enormously by the lion-worshiping public. Their perpetual cry is, Law, the Realm of Law, the Reign and Control of Law! They are the learned professors and expounders of natural law, in all the cosmos of force and life. Of course they are, of all the law in action now, from their atoms up to the life I am here living! Does not the President inform us that they can discern in that bare dead matter the promise and the potency of every form and quality of life?

Let me examine their legal attainments in something less than life. I ask them to state to me the laws which their atoms obey in the familiar changes from ice to steam. Forthwith they are ready with a torrent of words, from refrigeration and solidification, to calorification and vaporisation, with cadences in universality and invariability. I reject their fine words, and demand an account of the laws of the acting forces. I tell them, I doubt not the day will come, when some man or angel shall, on dipping his thermometer into the water, be able to assign the magnitudes, distances, vibrations and rotations, under known attractions and repulsions

in various lines, of those molecules, and to predict from point to point, and from moment to moment, the continuous changes of their behaviour to each other in the rising temperature from ice to steam, and back again from invisible steam to snow and solid ice. Can they give us one hint about all this? Can they answer or can they frame one sensible analytic question on the energy and continuous variation of those laws of force not vital? They know about as well how to do that as the geese of their tailors. I ask them, Can you state the laws of the resistance, from point to point, which an oar of given shape, at work under given force, encounters in the flowing, or even in the calm water? They cannot. Can you tell me the acting law of the pressures and resistances all round, which a bird or even a ball flying encounters in the stillest atmosphere of given density and temperature? They cannot. I give them their choice of any cubical quarter inch of force-locus, animate or inanimate, in air or earth or sea, and any moment of time they may select; if they can give a scientific statement of the continuous behaviour due to the acting forces of any three masses or force-points in that space, for one minute preceding and following, I will recant all that I have uttered. For a true and exact expression of any law of force acting at

one of God's force-points, besides gravitation, these jurisconsults of nature must wait for the teaching of another Newton. A list of empirical and discontinuous sequences is not a known and working law.

(166.) But you may remark that it is into the forms and qualities of all life, that is of the vital forces of matter as they call them, that these gentlemen claim to have so much insight. Now, do you believe, that men so ignorant of the definite laws of what they call inorganic forces are any wiser on those of the forces at work in my finger, or my finger-nail, or in one of my hairs, or in the hair of a seedling nettle, at any point from the tip to the root of it, or that they can tell us anything scientific at all of the way in which the fabric is put together, or fastened where it stands?

I wish I had the space to give here the result of my endeavours to find out something of what they know and can define, from some of their best physiological and histological manuals, written for the reading of younger and weaker heads than mine. I could tell to any student of the laws of life a merry tale about that 'beggarly account of empty boxes.' I should be glad of an opportunity of showing to him what I have learned of their discoveries with their microscopes, their vivisections, and their teasing needles, about cells and morphological ele-

ments, and what they choose to call protoplasm—(I wish I had time to exhibit the comical chaos of their definitions)—in the morsels which they cut away from every part of living, dying, and putrefying bodies, yet all alive! For, many hours, nay days after, when we have pickled and preserved it, when we have pumped into it our gases, acids, and steam, when we have boiled it in vinegar, and hardened it for fine slicing in a freezing mixture, and teased it and torn it, we can see that the particles and nucleoles of protoplasm are living and feeling, yea, whether they move on our heated stands or not; because—must be so! we know! And when we get our microscopes up to 500 more linear power, we shall catch the migratory cells in the act of conjugation, and complete our theory of cell-genesis! There is daring enthusiasm of superstition in what they do, and abundance of cruelty; but not a glimmer visible to me of any deduction, nor even of scientific conception, of law. Then these prophets of torture and mortal agony, these apostles of death and corruption, meet all smiling, with such elegant bows and compliments to each other, as Professors of Biology and the Laws of Life, that it is quite a lesson in deportment, most improving to us all!

(167.) The grandest of all their grand words, when they talk law, are Differentiation and Integra-

tion. They have discovered that the cell, the oak, and the whale are 'gradually differentiated' out of the endochrome, the acorn, and the embryo. That shows, you see, the infinitesimal exactness of their knowledge; you find it in many of their books, I think in most of them, and plenty of it. When Topsy was asked by her catechist, 'Who made you, Topsy?' she replied, 'I never was made. I 'specs I growed.' If that bright young lady had answered thus—'I 'specs I was differentiated,' she would have delivered one of the grandest lessons of biology on the law of vital processes. And if, when next catechised, she had replied, 'I 'specs I was integrated,' she would have delivered the same lesson in more learned style, framing and uttering, with those two words, every jot and tittle of the scientific conception of the origin and laws of living growth, for which they stand, in the heads of the professors.

Let me take care, as I may have to answer for all this, not to misrepresent these gentlemen. Permit me to quote three passages from Professor Tyndall's Belfast oration. At page 21 he says, speaking not so much for himself as for the Biologists: 'Nor can we fail to discern what vast modifications may be produced by natural selection in periods sufficiently long. Each individual increment may resemble what mathematicians call 'a differential' (a quantity

infinitesimally small); but definite and great changes may obviously be produced by integration of these infinitesimal quantities, through practically infinite time.' At page 29 he says, speaking evidently of the period preceding the evolution of life, that he himself discerns, 'in that matter,' 'the promise and the potency of every form and quality of life.' And at page 30 he says, 'It is by the operation of an insoluble mystery that life is evolved, species differentiated, and mind unfolded.' Pray, read this third bit once more, for there is no telling what some of you may come to; and you ought to study beforehand this dignified presidential circumlocution for that unbecoming word, *ignoramus*. I fancy that he means us to gather that he is quite beaten by the question, How did matter first come to life? He gives it up, doubtless to the disgust of his scoffing left, as 'an insoluble mystery.' But it is evident that he knows a deal, at first or second hand somehow, about the *operation* of the mystery. For if he had known nothing at all about it, what right would he have had, in that chair of science, to stick that word in *-ation* into the predicate of his profound and original theory of human ignorance? Can it mean a spawning or fecundation of atoms? It is evident also that the Professor, or somebody known to him, has skill in 'the differentiation of species,'

and, we may presume, of many other functions of the insoluble mystery. But can any of us make out why it should be quite insoluble to a mind able to discern in that previous matter the promise and the potency of every form and quality of life? We wonder no less why it should be insoluble to one who knows, in mathematical phrases, what he means by the *operation* of the mystery, and who 'cannot fail to discern,' from the first and simplest living things, 'the definite and great changes' which 'may obviously be produced' by differentiation and integration!

(168.) When mathematicians talk of differentials and of results of integration, they have before them, under even their symbols of number, an expression of quantity whose scientific law of growth is exactly given to them, so that they can form its values for themselves, from 1, 2, 3 in the scale upwards through the finest shades of difference, and are able to answer about its minutest changes of value every question How or Why that they require to ask. This given scientific law of growth is precisely what the biologists never have before them, nor can conceive, in their differentiation-and-integration talk.

The mathematician can rigorously define his terms differentiation and integration, and can teach boys how to illustrate their meaning by the simplest

examples with 1 2 3 and *a b c*, in which there is nothing vague or fanciful. I cannot learn that the biologists and evolutionists ever yet constructed one illustration of what they mean by the terms, by any combination whatever of elementary symbols or experiments. The reader has to find every outline and shade of meaning for himself *in nubibus*.

Who first brought these grand words into this dreamy use I know not, but I see that they are admitted, to the surprise of accurate thinkers, into papers printed even by Royal Societies.

Perhaps their most pompous and sublime employment is in Mr. Herbert Spencer's definition of the Law of Evolution ('First Principles,' § 57, 1863): 'Evolution is a change from an indefinite incoherent homogeneity, to a definite coherent heterogeneity, through continuous differentiations and integrations.' *Id est Anglicè*—Evolution is a change from a nohowish untalkaboutable all-alikeness, to a somehowish and in-general-talkaboutable not-all-alikeness, by continuous somethingelsifications and sticktogetherations. Can any man shew that my translation is unfair? When that is shewn, I will make a becoming apology for the unfairness.

I know that my tone will, to unscientific ears, sound almost outrageous to these teachers; but it will only be fair in them to enquire of the mathe-

maticians about their established use of their weightiest words. Mathematicians only can estimate and enjoy the value in law-learning of this allusion to them by the President.

But the picture on the whole, I think, is enjoyable by all, in the contrast between Professor Tyndall's frank confession of the utter ignorance of science about the origin and evolution of life and mind,—a confession in which we all join, although we do not presume to express our shallower *ignoramus* in terms so stupendously wise and philosophical,—and the ample claims which these doctors contrive not only to set up, but to get accepted by educated thousands, of profound biological learning. They know something accidentally and empirically; but how much by scientific deduction, in terms of law?

(169.) Whatever can it be, then, that these orators mean by their ceaseless prophesyings about the Reign of Law? They mean two things, one a vulgar truism, the other a prudent euphemism. The truism is that there is law, that the Cosmos is not lawless, that there is order and regular sequence, which can be noted,

> Till old experience do attain
> To something like prophetic strain.

But every henwife knows this truism. She can

predict the sequence from egg to chicken, from chicken to pullet, from pullet to sitting hen. She is quite clear about the bond between feeding and fattening, or poisoning and killing, although she never talks about 'correlation,' nor 'assimilation,' nor dogmatises with 'universality' and 'invariability.' The anatomist and histologist knows more terms of the sequence; he torments more Latin and Greek words; he makes and throws away more blundering guesses. But is he at any point of the sequence more competent than she is to define the laws of force which the changes and motions obey from point to point, and from instant to instant? In calling a process of work which is inconceivable to them by the name, crystallisation, fermentation, germination, or cicatrisation, do they fancy that they have thrown a ray of light, either on the changes and steps going on at close quarters, or on the laws of forces in action on molecules? Of those actual processes and laws they know about as much as the screws of their microscopes.

Next, the word law in their mouths is a prudent euphemism. It is 'law' for 'must-be.' That is their notion! Their great men dearly love to be spounding and splaining of 'necessary law:' and what is that? Just Must-be law! Some of them try to avoid *must*, and to do it with *cannot* and *im-*

possible. It is all the same dogmatism. If you have anything to say to me in science about demonstrated law, imparting your demonstrations, I will listen with all reverence. But *Must-be* law, though laid down with 'can't be' and *-ality* and *-ility*, is always in the mouth of the propounder, Our law, and My law! Their *can't be*, if unchecked, may turn into a terrible *shan't be.*

If now these Matter-and-Must-be doctors are not cosmic lawyers, what are they? In the first place, they are noble museum-makers. No praise of tongues more eloquent than mine can cover their deserts in the toilsome collection, not of profit for themselves, but of imperishable wealth for all, in their patient researches, and their masterly arrangements of what they find, whether facts of experiment or of structure. What a wondrous treasure-house it is of Divine Revelation, where we obtain our most intimate and instructive glimpses not of the Unrevealable as to Himself, but of God here and now Revealed outwardly to us; the treasure-house which they are ever filling, not only in glorious rooms and ravishing cabinets, but far more in the scientific memoirs and costly engravings laid up in the libraries! What if it be all little more than a skilful array of isolated facts? They are facts which can never become trivial or be forgotten; facts,

the connexion of which the Newtons among men and angels ponder and will ponder—with deep question asked and answered, with deeper question asked and answered, and with still deeper questions asked and yet unanswered—for ever and for ever!

And what to the student is rich and enriching Museum, to the unlearned who is capable of thought is Spectacle of beauty and glory. The teachers of this material philosophy rank high, in the second place, among the noblest spectacle-makers. What is the costliest splendour of your theatres, though living queens and emperors in all their pomp and pride be there, compared as spectacle with a case even of dead humming-birds? What feasts for delighted eyes like those of God's marvellous works wisely arranged, laid bare or truly pictured; or like the sorcery with which Professor Tyndall knows how to enchant the gazing thousands, uplifted all and more or less purified as they gaze, by those manifestations which flash at his command from the dread unknown forces that play around him? We all alike honour the mighty grasp and exquisite delicacy of that master-hand, in the exhibition of those scientific spectacles. Let that be heartily said. But it cannot be quite all praise. Is it not a long way, think you, from museum-making and spectacle-making to the claim of insight into 'the power and

potency' 'in that matter' 'of every form and quality of life'? Is it not a longer way from museum- and spectacle-making to the control of the domain of cosmogony?

We shall not soon forget the imposing picture of Professor Tyndall at the top of his tall ladder, with the hammer in his awful hand, nailing up that thundering board:—Take notice! All parsons, poets, metaphysicians, and moralists among men or angels, who after this date may desire to meditate or philosophise in the domain of Cosmogony, or in any province thereunto reaching, must submit all that they think, believe, or speak to the control of what I call Science. Given at the Board of Control of Cosmogony, by order of their godships, Matter, and his mother Must-be, and signed John Tyndall, President.

Nor can we forget that most edifying picture of the same John telling his experience at Meeting there in Belfast, and meekly confessing with closed eyes to the brethren and dear sisters, how he often prolongs the vision backwards across the boundary of the experimental evidence, and discerns in that matter—but Stop, you say—Is not discerning by prolonged vision across a known boundary, in the mouth of a man of science, just a fact of experimental evidence? What other evidence have we of the

remoter nebulæ and stars? Ah! you know nothing. It is the *experience* of that blessed John, which has so often prolonged the vision across the boundary of experience; and there he himself has discerned in that matter, millions and millions of years ago, 'the promise and the potency of every form and quality of life,' from cheese-mites up to Cherubims! Do you believe that

> The sweet little cherub that sits up aloft,
> Keeping watch o'er the life of poor Jack,

had not fun enough in him to send to the celestial 'Punch' a playful cartoon or two about his scientific darling?

Ah! good reader, thinking of our dear friend the Vicar of Wakefield, I cannot repress the wish—O for the pencil of a Goldsmith, that I might worthily paint that great Doctor at that fair, conquering Moses, and astonishing all men, with his cosmogony and his spectacles!

(170.) To the majority of readers, my tone of sarcasm and censure upon an eloquent and popular school of physical philosophers will appear unbecoming and unjust, if not outrageous. I maintain that it is justified by the comparison which I have made between what they know and what they, with so few scruples of bashfulness, pretend to know about Law,

and by the challenge which I have thrown down to them to prove their pretensions. Yet it is due to the reader and to myself to show, that these Matter-and-Must-be doctors have incurred reproof far more severe than anything that can fall from me, who do not pretend to have any skill in their departments of science, from one of their peers, second to none of them in philosophic power and renown. The following extracts are all made from the first part of 'Protoplasm, or Matter and Life,' by Lionel S. Beale, M.B., F.R.S.; third edition, 1874:—

'Will any number of such extraordinary assertions as these enable us to explain the movements of a little bit of living matter? Does the law of conservation of energy throw any light whatever upon the cause of the vibration of a single cilium?'—p. 22.

'The physico-chemical school pretends that the phenomena to be observed in a living thing, or a bit of living matter, can be explained by known laws; but they do not even attempt to give an account of one of the changes characteristic of any living thing in nature. They cannot imitate the phenomena occurring in the simplest form of living matter.'—p. 23.

'It is very strange, but nevertheless true, that those who teach us that "*suns may resolve themselves* (!)

into floræ and faunæ" are quite unable to show how a very minute portion of sun becomes "variously modified," and resolves itself into a minute particle of living matter, such as a microscopic fungus, a pus-corpuscle, or a cancer-cell, or any other living thing. . . . The formation and destruction of faunæ and floræ, of asteroids and worlds, of suns and systems, are to engage the attention of the fortunate student of these days, not the perturbations of a cell or the oscillations of a bit of living jelly.'—p. 41.

'Neither the chemist nor the physicist has taught us anything concerning the actual changes which take place when pabulum becomes totally changed and converted into living matter, or when the latter gives rise to some peculiar kind of formed matter.' —p. 44.

'Mr. Justice Grove has recently affirmed ("British Medical Journal," May 29th, 1869, p. 486), that "in a voltaic battery and its effects" we have "the nearest approach man has made to experimental organism;" but he does not show us in what particulars the voltaic battery resembles organism. . . . Neither Mr. Justice Grove nor anyone else has yet adduced a single argument to justify a comparison between any living organism and any machine.'—pp. 46, 47.

'Tyndall tells us very plainly that "molecular forces determine the *form* which the solar energy

will assume. In the one case, this energy is so *conditioned by its atomic machinery* as to result in the formation of a *cabbage*; in another, it is so *conditioned* as to result in the formation of an *oak*." ("Heat considered as a Mode of Motion," by Dr. Tyndall, 2nd edition). Whole volumes might be written in such style, without conveying any information to the reader's mind. The reader, of course, wants to have interpreted to him what is meant by the "molecular forces," and the nature of the act of "conditioning," and the character of the "atomic machinery." '—p. 52.

'Of late, few terms have obtained such pre-eminence as the word "molecular." "Molecular forces" are supposed to account for some of the most important phenomena of living beings. Molecular physics is the science of living things, and it would seem that those who understand it are enabled to account for every vital action. . . It unfortunately happens, however, that hitherto no one has been able to define exactly what is to be understood by a "molecule." '—p. 58.

Dr. Beale might safely add, that if Dr. Tyndall could get a molecule clearly into the field of a microscope powerful enough, and had Professor Huxley to help him with his mastering theorem ('fact I know and law I know'), quoted by Dr. Beale at page

76, they would boil all the 'lobster protoplasm,' kill all 'the matter of life,' and roast every 'structural unit,' of life in England, before they got hold of the scientific expression of a single one of the numerous laws proper of force in action in and upon the molecule, except the law of gravitation, which a certain mathematician taught them.

'Mr. Huxley maintains that protoplasm may be killed and dried, roasted and boiled, or otherwise altered, and yet remain protoplasm.' . . . 'But the statement is incorrect, because in the process of assimilation what was once "protoplasm" is entirely disintegrated, and is not converted into the new tissue in the form of protoplasm at all.'—p. 100.

'Correlation is the "abracadabra" of mechanical biology. . . The phenomena formerly supposed to be due to "differentiation" are now regarded as the result of correlation. . . But as yet, no operation characteristic of any living being has been explained upon any physical principle. . . Not the shadow of proof in favour of the analogy supposed to exist between life and other forces has been yet adduced.'—p. 72.

The reader will find plenty more of this unmerciful hitting in the charming volumes of Dr. Beale. He is a man worth punishing for his presumption.

A single proven fact, if the assailed dogmatists could produce one, would turn to nonsense and falsehood his sweeping negations.

And now, after writing and printing all this, I have the humiliation of sitting on the stool of repentance, a spectacle for gods and men, as I beat my breast with *mea culpa, mea culpa, mea maxima culpa.* I have to retract all that I have uttered against the scientific accuracy of Prof. Tyndall in that relation of his experience at the Meeting in Belfast. I have the pain of avowing that he told nothing more, but less, than the truth about his superhuman vision. Woe is me, that I should have yielded to my besetting sin, and appeared to speak of him in that illustrious chair as of one of 'the foolish prophets that follow their own spirits and have seen nothing.' He had seen it all. Oh, that he had permitted me to see it sooner, that I might have been spared this shame! These eyes have been blessed with such reflection of the glory as can be given to the world. In the 'Fortnightly Review' for November 1875 Dr. Tyndall describes the living miracle of the developed babe of nine months in the womb. He tells of its beginning in the ovum 'no more than the $\frac{1}{120}$th of an inch in diameter.' He points to the eye, the ear, and all the marvellous organs. 'Consider the work accom-

plished during these nine months.' Again and again we are invited to consider; and as we are lost in the wonder—How? and By whom?—there comes this blinding flash: 'Matter I define as the mysterious thing by which all this has been accomplished. How it came to have this power is a question on which I never ventured an opinion.' Here is no escape for poor me. There, in that burning definition which his own right hand had engraved upon the century, he verily did 'discern' through his occiput, and, as he said, 'beyond the boundary of the experimental evidence,' not merely 'the promise and the potency,' but the very accomplisher, of all that miracle of life! 'The mysterious thing by which—' Say not by the means or instrumentality of which. Far nobler is the truth which 'I define.' How matter 'came to have this power' he has not yet, as he reminds us with dignity, informed us. We can wait. But he saw not only that which had the power, but that which verily had exercised the power, to accomplish all those wonders. He knew exactly where he saw it. His eye was fixed on the κτῆμα ἐς ἀεὶ in his study, over whose fulminating characters were suspended the orbs of astonied cherubim, as their intellects reeled under the thunder of their import: 'Matter I define as the mysterious thing by which all this has been accomplished.'

The seraphic anthem about The Works, which the poet heard in heaven, pealed thus:

Ihr Anblick gibt den Engeln Stärke,
Wenn keiner sie ergründen mag;
Die unbegreiflich hohen Werke
Sind herrlich wie am ersten Tag.

If there had been a Tyndall among those archangels, that second line could hardly have been chaunted. It would have been a little rude. Raphael showed, in singing that, but a limited acquaintance with science. He had yet to learn how

Savans rush in, where angels fear to tread.

Quote no more Goethe's 'Wer darf ihn nennen?' The man who is competent not only to name, but to define, the accomplisher of this ALL of Force and Life, must have found his way somehow to the bottom of the mystery.

APPENDIX.

Note on Section 11, *Chapter I.*

PROFESSOR BAIN'S Treatise on 'Mental Philosophy' begins thus: 'Human knowledge, experience, or consciousness, falls under two great departments. Popularly they are called Matter and Mind. Philosophers further employ the terms, external world and internal world, not-self or non-ego, and self or ego; but the names Subject and Object are to be preferred. The experience or consciousness of a tree, a river, a constellation, illustrates what is meant by an Object. The experience of a pleasure, a pain, a feeling, a thought, comes under the head of Subject. There is nothing that we can know or conceive of, but is included under one or other of these two great departments. They comprehend the entire universe as ascertainable by us. The department of the Object, or object-world, is exactly circumscribed by one property, Extension: the world of subject-experience is devoid of this property.'

It is requisite for me, from my habit of slow thought and self-suspicion, to study this opening lesson, first as a lesson to myself, about what I know or can know. For my feeble deglutition I have to break up this 'we' into 'I and you.' Whatever to me is scientifically true about this *we*, must be true and verifiable to me about myself; and

before I can speak confidently concerning the knowledge of other people comprised under the *we*, I must make myself clear and sure about my own share of it.

First I have to ponder these theorems, putting *I* for *we*: 'There is nothing that I can know or conceive of, but is included under one or other of these two departments. They comprehend the entire universe as ascertainable by me. The department of my object-world is *exactly circumscribed* by one property, extension. The world of my subject-experience is devoid of this property.'

All seems pretty lucid, except the trope *circumscribed*. What I want to know, and what, I presume, Prof. Bain means to teach me, is not what circumscribes this object-world beyond it and outside of it, but what it contains—in fact, what is inscribed all over it. I may venture, I think I am bound, to gather, that my teacher is informing me that my object-world contains nothing but what is extended, or has the one property of extension. If words are of use to convey a meaning, I am evidently here instructed that, just as *everything* in the internal world of my subject-experience is devoid of extension, there is *nothing* in my external or object-world which is devoid of extension, nothing but what is extended. That is, everything in my not-self, or non-ego, has the property of extension, and is in that department of my human knowledge which is popularly, but not, it would seem, improperly called Matter; while myself, my ego, is in the other department, Mind. And it is as certain as the foundations of Mental Philosophy can make it, that these two departments of myself and my not-self include all the universe ascertainable or conceivable by me.

Being timid, and afraid of blunders, I proceed to verify this as well as I am able, by the examination of my slender

stock of knowledge. I see and I appreciate all the illustrations offered by Prof. Bain. One thing more occurs to me. I know you the thinkers, as thinkers, that is, the reader and other friends. I have somehow come to know you, not merely as bodies, bundles of phenomena, and external loci of force, but as thinking minds. How I have this knowledge I need not explain; nor am I pretending to be wiser than my teacher, if by *we* he means, as I presume he does, *we thinkers*. It follows that all my conceptions and knowledge of you thinkers is part of my knowledge of the external world of extension. You are certainly not myself, you are in the department of my not-self; and are therefore known and knowable to me only as something extended. I the thinker am devoid of extension; you the thinkers, being, like trees and constellations, known to me in the non-ego, are a part of the material world outside of me.

O toys and make-believes, O tropes and generalities;—what were young life or young philosophy without you? The youthful students of philosophy all prefer with Prof. Bain the names Subject and Object, and the terms Subjective and Objective, to most others. Like Substance, they are so Latin and so learned. Will nobody ever discover Obstance and Obstantivity, nor Nosity and Nositivity? These, like Subjectivity and X-substantiation, like the old Egoity and Personality, and the leading article brilliants, individuality and idiosyncrasy; these, like Mr. F. W. Newman's IDENTITY (p. 330), or that grand Unity of Infinity, out of which 'Macmillan's Magazine' has recently knocked quite a fireworks of religious light; these are all noble abstracts, and must every one of them have a profundity of sublimity. Let us all go and dig for it.

I do not believe that any reply to all this is possible

besides these three. *First*, you have used a very unbecoming freedom in this first page of Mental Philosophy by smashing up the fundamental *we*. We *must* begin with *we*. Don't you see how it enhances the breadth and depth of the teaching? *Secondly*, you ought to be aware that Mental Science scorns mere details, and handles only the grandest generalisations. *Thirdly*, everybody knows that our profoundest thinkers always refuse to investigate the relations of the Cosmos to their separate conscious selves. To that *thirdly* I must bow. No man can deny that in declining to do this there is a large philosophical dignity. The Cosmos has no right to expect that. That, you know, courteous reader, would be personal.

If I have misunderstood Prof. Bain, it is because that 'exactly circumscribed' is too deep for me.

One great advantage is secured by our scientific simplifiers by starting from this muddle of a *we*. They avoid the embarrassing logic of the step from 'I know that I am a thinker,' to 'I know that thou art a thinker,' and they escape the intrusion of the light which will rush in there from the intelligent Cause and the Conscious Upholder of the Universe.

Professor Huxley has somewhere propounded in one of his sermons, that instead of 'I am,' 'Thought is' is the true starting-point. I agree with him that it is a blunder to arrive at *ergo*, I am, as a conclusion; but it is still more queer that *thought* should be posited before a thinker, and apparently without one. How am I to find this first beginning? How am I to discover that thought is even in my own pate, before it has dawned upon me that 'I am a thinker'? I have to find this beginning by beginning before the beginning. As to *thought* being in other minds, or in no mind at all, these are matters that to a good

doubter require a little proof before he can allow them. Here is a mess, or to speak more reverently of a sermon, a mystery at the outset. It is a very proper thing to find in a sermon, and Professor Huxley is all the more a fine preacher, that I cannot understand him. I fancy that we have here an example of philosophic simplicity and frugality, in making one word *thought* do duty for two conceptions, wide as the poles asunder; one the *cogitation* of Des Cartes (5), the act of a conscious mind; the other *cerebration*, a movement or vibration of brain, of which the owner of the brain is not conscious, and which Physiology can most vaguely imagine, but can neither describe nor verify. That virtuous economy which contents itself with one term for two incongruous meanings, is not without its use or praise: it is very good in sermons; but it will hardly become the rage in science, even if a Huxley should set the fashion.

APPENDIX II.

Note on Section 16, *page* 26.

Abstracts and generals are in some sciences real condensations of knowledge and instruments of accurate research. But in what goes for Philosophy they are often tinted dilutions of elementary thought, that hugely decorate the mystic shop-window of Metaphysic. Many of them have come into fashion in attempts to simplify by periphrasis truths which cannot be simplified, but which are, nevertheless, as clear and certain to the ploughman as to the philosopher. Their abuse has well nigh justified the

reproach of Ferrier ('Institutes of Metaphysics,' § 16): 'Indeed, it may be affirmed with certainty that no man, for at least two thousand years, has seen the true flesh-and-blood countenance of a single philosophical problem.'

It is easy, and it is considered profound, to periphrase 'I am.' My subject is endowed with the attributes of Being and Consciousness: I find myself in the Category of Existence: I am a concrete of accidents inhering in a substance: I am an illusory complex constituted by a group of states: I am an entity clothed with the most abstract of all abstracts, Essence. Then follows—What is consciousness, existence, &c.? Then sage debate about '*separate* existence, or existence freed from the condition of belonging to a substance' (J. S. Mill's 'Logic,' B. I, c. iii.) See also Ferrier, 'Metaphysics,' § 66: 'Existence is a category of human thought; and therefore those reasoners who are frightened by the bugbear which they call "anthropomorphism," have no right to attribute it to the Deity; but ought in consistency to be called atheists.' See farther whole volumes about *Wesen, Werden, Ansichseyn*, &c., and their equivalents in all tongues, which, like that *dictum* of Ferrier, and that section of Mill, are to my palate the weakest thought-and-water, too often clouded with Greek and Latin ambiguities, and spiced with nonsense of tropes, and with cruxes and contradictions made out of zero and infinite, those easiest and most imposing tricks of mock-science.

No less confusion arises from copious periphrastic dilution of 'I ought,' 'I can,' and 'I will.' By mystifications with the abstracts introduced in these dilutions, our matter-and-must-be simplifiers of the Cosmos find it easy to prove that all mankind are cheating themselves in the affirmation of every one of these fundamentals. They can

show that my Ego is an empty fiction, that my Will is a delusion, that my Power is an absurdity, and that my Moral Obligation is moonshine. At small expense of Logic, they pleasantly find themselves for the moment, because they are well understood, popular on platforms and in our monthlies, which they grace with their contributions ostensibly for the sake of imparting something of the sciences which they know, to a public which cares little about what it cannot comprehend, but is deeply interested in what it can and does understand as well as the professors. People feel every thump at common-sense and conscience, and, the more it hurts them, the more they are often pleased with the new sensation of being philosophers. I may refer to a clear exposure of the sleight of hand of these men of science, and a sorely needed lesson to them on the use of Greek words, in the 'Theological Review' for October by 'Presbyter Anglicanus,' in a notice of Dr. Carpenter's lecture at Glasgow, 'Is man an automaton?'

'The people of Glasgow have been found,' says this writer, 'to listen patiently while Dr. Carpenter dilated on the topic that man is an automaton. They would probably have been less patient if he had started with the rigid definition of the word, which he took care never to give at all. Instead of this, he puts forth some three or four descriptions, in which the utter inaptness of the comparison is kept out of sight, while his hearers are left to derive their impressions from the jumble of notions thus put into their heads. "What do I mean by an automaton?" he asks; and he answers his question by telling us that "the word automaton is derived from two Greek words which mean self-moving. Well, of course man is a self-moving animal, and in that sense he is an automaton." But, if it be thus, the whole matter is determined in a way

which leaves nothing to be desired by those who believe that we are in the hands of a righteous Ruler of the Universe. If man be self-moving—that is, if he originates his own actions, and if he knows, as beyond all question he knows, that these actions, with their results, affect his condition—if he feels, as assuredly he feels, that there are things which he ought and ought not to do, and that he can do or avoid doing them if he will, then the great fact of consciousness and conscience, of duty and responsibility, are all involved in the word automaton. But, in this case, nothing more would be needed than the assertion, that a meaning has in modern times been put upon the Greek word which to Greek thinkers it never conveyed. When then Dr. Carpenter goes on to say, that "it means a structure which moves by a mechanism, and which can only move in a certain way," he ought to have added, that a Greek would never have found in the word the meaning they have arbitrarily foisted into it. In whatever sense the Greek writers may have used the term, all the shades of meaning involved either complete freedom of willing and acting, or the absence of all external agency. But, without going farther, it is obvious that the two definitions given by Dr. Carpenter are contradictory. Why did he not tell his hearers so? If, again, man is an automaton in the strict meaning of the Greek word, as being literally a cause of movement and action, why does he go on to multiply descriptions of automata in the sense which we in modern times have chosen to attach to it? Of what use is it to tell us that if the apparatus of an organ blown by water-power "were encased in the frame of a human figure, and made to work the bellows handle up and down, we should call it an automaton," unless we are to infer that man is an automaton of this kind? Yet, again, he adds, that by an

automaton we mean "a machine which has within itself the power of motion, under conditions fixed for it and not by it. A watch, for instance, is an automaton. You wind it up, and give it the power of movement, while you make it regulate itself by its balance, which you can so adjust as to make it keep accurate time. Any piece of mechanism of that sort, self-moving and self-regulating, is an automaton." The reader may be pardoned if he expresses some impatience at being involved in a maze of inconsistencies, if not of contradictions. If, as Dr. Carpenter allows, the organ and the watch are framed by a man who deliberately determines the relations of all their parts, and if they can move only when he wills, and as long as he wills, then neither the organ nor the watch are self-moving or self-regulating. The power which produces these results is wholly external, and therefore these machines are not in the sense of the Greek word automata at all. But even if we granted the correctness of the definition here given of the organ or the watch, the definition would run somewhat after the following fashion: "An automaton is a machine made by the hand of man, availing himself of the forces of nature, gravitation, elasticity, &c." If Dr. Carpenter had said, what the premises clearly involve, namely, that man is a machine made by man availing himself of natural forces, the absurdity of the whole thing would have become patent to all who heard him. We may take another aspect of the watch or organ, as described by him, and note that, according to Dr. Carpenter, they move by a force not dependent upon anything like a will of their own. What would his hearers have said, if he had told them in plain terms that man is a machine moved by a force not depending upon anything like a will of his own? If he did not mean this, wherein lies the appositeness of the illustration,

and what can the whole inquiry be but sheer waste of time, if not a disingenuous effort to sap principles of thought and action which need to be strengthened to the uttermost.'

The reader, who sees the muddle of mock-science in this use of the word automaton, may not accept my remark that this lesson by 'Presbyter Anglicanus' was sorely needed. He has a right to ask for more evidence of the ill-use of Greek and Latin words. It is, alas! too easily produced, both old and new. I content myself here with pointing to the term *protoplasm*, now in the height of fashion in some scientific circles. In the sound of the word *bioplasm*, as guardedly employed by Dr. Beale, there is nothing inconsistent with the modesty of philosophy, nothing of dashing dogma, nor of loud pretentiousness. Dr. Beale, I doubt not, is able to justify to a competent observer all that he has affirmed about that visible and unsearchable wonder, bioplasm. But the other term carries with it inseparably the ring of a different metal. Tell me candidly, is there anything of pure theory in that shocking Syllabus so cool as the effrontery of the syllables *protoplasm?* I venture to say that it is the ring of it, and not any demonstrated science yet on record about it, which has made the word and its prophets so very remarkable.

My object in beginning this note was to make an observation on the word Power, which figures in dilutions of 'I can' and 'I will.' I am not speaking of power attributed to rank and office, nor of power rhetorically applied to abstractions, passions, and personifications; but of power manifested in act at definite time and place.

When I endeavour to state and verify what I know about finite power (the infinite is all outside the little science that I can lay down in clear propositions) I find that my real knowledge falls into two compartments; one, that

of my own will-force, the other that of the forces with which my will comes into conflict in the Cosmos. The second I am constrained to break into two divisions; one of which comprises the manifestations of will-force in other finite sentients and thinkers, of whose presence and action I am convinced; while the other includes what I call, from my experience, or from imagined multiples of my experience, the constant inanimate forces of nature. Whether I think of power in act, or of power whose future action I expect or predict, I can neither give nor conceive for my notions of it any other explanation or deduction. And when I hear a man refining about conceptions of power and potency which have some other pedigree, I learn just nothing—and I am convinced that I learn all he knows.

I respectfully submit, that it would be a gain to accurate science, if the word *power* were confined to denote the manifestations found, inferred, or to be expected, of will-force; the term *force* being the name of that which Will encounters in measurable degree, or of the vast multiples of such degree, which we call the constant cosmic forces. Thus I can say that my finger is moved by my power, as yours is moved by a force which I hold to be your power; and that the rain drops, my heart beats, the silver tarnishes, the glue sticks, the nail holds, the sugar dissolves, the lime is slaked, the sap rises, or the thermometer falls, and millions of other changes go on around me, by as many different forces, all alike, in their real origins, beyond the tether of my philosophy, and about the law of whose action *in loco* from point to point, and from moment to moment, I have pretty nearly the science of my horse; except that about the first, gravitation, my partial knowledge surpasses his.

If this rule had been observed in the use of the word

power, we should have been spared the small quibble in Hume's note, quoted in (16), about the power of inanimate matter ; and we should have missed the edification of Dr. Tyndall's famous vision of the 'promise and potency in that matter,' 'of every form and quality of life.'

APPENDIX III.

Note on Section 47, page 77.

I am far from presuming to give the form which the first statements about the dynamical starting-point will one day assume. The force-point having changing position but no parts is common enough in our manuals ; but it is generally considered to be a device of theory for mathematical convenience. No objection of which I am aware has been made to it as in itself absurd. If with Boscovich we define that such force-points are facts in nature ; and if we grant, what accuracy seems to require, that two such points must by definition be always numerically and geometrically two, so that in their changes they can never occupy the same position ; we shall find ourselves setting out with this tremendous theorem—that there is in every force-point an energy of repulsion at the closest quarters, whereby it would be able to repel, from a certain sphere around it, the onset of the whole Cosmos on every hand.

APPENDIX IV.

Note on Section 114, *Chapter X.*

I have taken a little pains to find out what our vivisectors and biologists can define about the laws of life and growth. Something, said I to myself, ought to be within my reach and comprehension, of their first steps in this biological knowledge, in the manuals written for the instruction of younger heads than mine. Having heard that the best information for the English reader was to be found in the 'Manual of Human and Comparative Histology' of S. Stricker (The New Sydenham Society, London 1870), and the 'Manual of Pathological Histology' by Dr. Edward Rindfleisch (the same, 1872), I devoted some time to the study of these volumes. In the latter, vol. i., p. 88, in the chapter 'On Normal Growth,' I read: 'The first foundations of every organ are laid by the differentiation of elementary parts, which are originally equivalent. These elementary parts are small round cells, furnished with large nuclei.' In the former vol. i., p. 45, I read: 'We can here only refer to the general importance of cells in the animal body, and in regard to their formative activity it may suffice to point out that every organized portion of the animal body must originate in or from cells. In addition to the organized constituents of the animal body, chemical compounds are also present in it, which, so far as they have not been introduced in these forms, must be regarded as the products of cell activity; but we cannot ascribe the non-organized bodies, even though they

may be deposited as solid compounds, to the formative activity of cells.'

This I found pretty clear, so far; and I did my best to swallow the *must originate*, of which no proof whatever is offered. As a beginner, I naturally paused over two hard words in the two sentences. One was *differentiation*. The term *equivalent* guided me to a guess, which I hope is nearly correct, that the 'elementary parts' were originally all alike, but have in some way become in time not alike. Of course the teacher tells me that, and much more, namely *how* they have become not alike, by the process of *differentiation*; which it is only polite to suppose that he understands, and could help me if he chose to understand also. There is a good deal about differentiation, of which I tried in vain to learn something. I gave it up when I came to the following, and I am afraid I said, all talkee talkee!—'In the present state of Science we must acknowledge that we are unable to see any differentiation of parts under the microscope,' p. 28. I suppose they have seen it somehow over the microscope. I said to myself, How do they know that the parts were 'originally equivalent'? They have compared a chick half-hatched with an embryo in the egg. I saw how they discovered the unlikeness of parts in the former, but not how they got at the equivalence of the parts in the latter. Of course they have wonderful microscopes and more wonderful eyes. But I feel persuaded that if the same eyes were over an unresolved nebula in a wonderful telescope, the learned noses would be practically as near to one object as to the other, for a scientific decision of the question, whether or no the parts of the thing observed were 'equivalent.'

The other hard word was *non-organized*. At page 9, I read of 'living or organized matter,' where it is certain

from the context that organized means living. But I failed to make sense by putting not-living for non-organized, because of the 'chemical compounds' mentioned. This did not detain me long, so eager was I for information about cells and cell activity, and above all, about protoplasm. At page 4 I read: "Brücke, 1861, who regards the cells as elementary organisms, admirably expresses the ideas, the development of which has been lightly sketched in the following passage:—'If we consider,' says he, 'how complicated the mechanical arrangements must be which lie at the root of the spontaneous movements of cells, and if we consider further that up to the present time we have only paid attention with the microscope to obvious and perceptible movements, and that no regard has been paid to the arrangements by virtue of which the little organism nourishes itself, increases in size, and begets its like, nor to any of those means by which it displays its specific attributes; if we, I say, consider all this, we must recognise that we have to deal here with an organism, the complication of which, although truly not comparable with that of an animal, nor affording any good reason for believing that it is itself composed of innumerable small organisms, yet constitutes one to which we may fairly attribute the possession of a highly artificial structure, the essential architectural elements of which are, however, completely beyond our grasp.'"

Here I pondered, without being able to solve it, the question—Should I at twenty years of age have had as much faith as the youngsters of to-day have, who believe, on the bare word of a German biologist, that every cell in every body is an organism ('a living and independent being,' p. 2) which does for itself these wonderful things? But it is highly probable that I might then have felt it my duty

to admire with Stricker, far more than I can now, the profundity of Brücke, when he says:—if we consider first, how complicated the mechanism must be, and secondly, how utterly ignorant we are about all the arrangements, we must recognise first, that the structure is highly artificial; and secondly, that the said arrangements are beyond our grasp.

I asked myself, How did Brücke and these philosophers satisfy themselves that the movements of the specks in their microscopes were truly spontaneous? Not a bad answer caught my eye at p. 17. 'It is customary to call the movements of protoplasm spontaneous. But this only shows that we are ignorant of the forces by which the movements are originated and sustained.' So *spontaneous* is one of the large stock of useful words whereby these sages hide their ignorance. The remark is made, not to withdraw the attribute of spontaneity, one of their grandest terms, but to guard against that most horrid, to the Must-be Vatican, of all heresies, the belief that there is in the Cosmos any such thing as *will, i.e.*, 'an immaterial force,' p. 17, where it is carefully denied.

On page 4 I read: 'IDEAL TYPE OF A CELL Johann Müller proved. . . . Schwann (1839) demonstrated. . . . Here then we have a cavity bounded by walls in the interior of which is a nucleus. . . . Individual and scattered opposition to this ideal type of a cell was ineffectual so long as the whole theory of Schwann was contested, as it was, for example, by Arnold, 1837.' This seems a somewhat defective translation, and means that for a long period the ideal type was triumphant against opposers in the fashionable dogmatism of the biologists. The 'vesicular construction,' page 6, soon disappears. 'Max Schultze, 1854, defined the cell to be a little clump

of matter (protoplasm) with a nucleus.' Next, p. 9, the nucleus also goes: 'We must exclude the nucleus as an unnecessary factor in the ideal type of an elementary organism. We must also in future apply the histological term cell to the morphological elements of the higher animals, or to independent living organisms, even if we are unable to discover anything more in their structure than that they are little masses of animal sarcode or protoplasm.' . . 'I also know that in other places where many young cells are collected together, fragments or minute separate particles occur about the size of a nucleolus, which, if they become attached to the slide, sometimes exhibit very lively movements, and this especially if the object plate be warmed to from 68° to 70° Fahr. May we now, in consequence of our new definition, consider these little masses as cells? . . . In the present state of our knowledge we shall certainly reply in the negative. We shall continue to regard such minute masses as living or organized matter without reference to their size, so long as the optical means of research at our disposal do not permit us to make the observations necessary for a different statement.' Thus in the smallest portions of the 'living matter,' we have nothing left, not even the name, of the fundamental cell.

Such was the charming dissolving view which these wizards placed before my wondering eyes, when I sought to know a little of their awful wisdom about cells! That is their accurate science of the 'first foundations of every organ,'—'elementary parts which were originally equivalent!' Which is a cell?—say I, as I peer into their microscope. They do not answer with the peep-show man, Whichever you please: but their reply is Whichever we please! If we consider the clump of protoplasm, with or without either wall or nucleus, big enough, we dub it a cell,

'a living and independent being,' p. 2, 'an independent living organism,' p. 9, which 'nourishes itself, increases in size, and begets its like.' If we do not think it big enough, we call it 'an isolated fragment of living substance,' p. 9, 'a minute mass of living or organised matter,' p. 9.

Having learned so much about cells, I begged the favour of a lesson or two on protoplasm. I had made a note of a definition of it which I had read in the 'Quarterly Review,' January 1869. 'The definition of vegetable protoplasm as given by Hofmeister will stand as well for animal protoplasm: "Protoplasm is an essentially homogeneous substance of viscid consistency, containing an abundance of water, but mingling very slowly, and that not in every proportion, with water. It is a mixture of various organic constituents, among which proteid and amyloid matters are never missing, and appears to be made up of a transparent colourless or pure yellow ground or base, in which are strewed a greater or less number of granules of various sizes, but extremely minute, and of different refractive power." It is new living matter, devoid of all special organs, but possessing the fundamental attributes of life. It is irritable. It can move and feel.'

I had always admired the scientific precision of this definition, although I was not quite clear in my conception of an essentially homogeneous substance containing an abundance of water and a mixture of various organic constituents. At page 10 of Stricker's volume I find a definition of *homogeneous*, which occurs in many other books on protoplasm. He writes 'homogeneous or destitute of structure.' Structures essentially structureless, is the usual and proper phrase. They are all quite certain on this point. How do they prove the negative? Of course by their microscopes, and Must-be-so! We know! They

could pronounce with the same positive authority on the structurelessness of the remotest nebula! If there was any structure, their sharp eyes would see it, you know, just as John Stuart Mill and the 'Westminster Review' could see that matter was uncaused and eternal; or as Professor Tyndall in his vision backwards could discern in that procosmic matter the promise and the potency of every form and quality of life. Philosophy is wonderful when her spectacles are on, for vision both backwards and forwards.

At page 11 of Stricker's Histology I read: 'Protoplasm is termed a living substance, and the application of this term is based upon its exhibiting the sum of those phenomena which we have learned by experience to be characteristic of living animals. These phenomena are active or spontaneous movement, nutrition and growth, and the capacity of reproducing its like.'

I am not ironical when I say that this is an honest attempt at a scientific definition. Can any such be quoted from the writings of any of our English biologists? The style of it is marvellously different from that of Professor Huxley's striking sermon, which first made the unlearned public familiar with the word protoplasm; very different from the story of his journey at the head of his admiring crew, 'through the territory of vital phenomena' to the 'structural unit,' and from his fine tropes of 'the matter of life,' 'the physical basis of life,' 'the clay of the potter,' of whose changes 'thought is the expression.' Of course it can be alleged that the Professor was not then playing the man of exact science, but the popular preacher. I submit that a Professor of Science, who has a gift for preaching, should hold forth with unction on other people's themes, but always try to talk both sense and science upon his own. If you wish to shine as a preacher you should choose a

subject, not that you do, but one that you do not understand. It is honourable to Professor Huxley that he can so shine, even under the disadvantage of knowing something about what he is handling. How much more without the disadvantage.

I was delighted with Stricker's statement of the reasons necessary and sufficient to justify the use of the epithet living as applied to this nondescript protoplasm. If it exhibits the sum spoken of, of the phenomena of life, it is correctly denominated *living*. All that is requisite now, said I, is that I should learn when, where, and to whom the phenomena have been exhibited, and that I should be allowed to have a peep or two for myself. I begged the learned Stricker to go on. And he went on like a man. First about movement. 'The movement of cells is easily to be seen:' p. 11. 'The movement of the granules is either continuous or vibratory:' p. 12. The continuous movement is then described on the evidence of observers: but it is all in crowds, 'a flowing movement,' 'a gliding or streaming motion of granules;' 'as the passengers in a broad street swarm together:' p. 12. 'They frequently become stationary in the middle of their course, and then turn round: but the greater number pass to the extreme end of the thread, and then reverse the direction of their movement:' p. 12. The thread is one of 'the threads of protoplasm that the foraminifera project through the apertures of the shell.' It is evidently a countless crowd of little things perhaps of the thousandth of an inch in diameter, or less, in a current in a rapidly moving thread. I did not find that quite satisfactory evidence of life-movement in separate independent organisms. But of course I am a sceptic. Next he talks of the vibratory movement of granules. Objections unpleasantly intrude here: 'Neumann

founded his objection on the fact that the vibratile movements still occurred in cells which were dead or on the point of death:' p. 14. And in the same page our honest Stricker remarks, 'In the meantime, observation of the movement of the granules alone cannot enable us to draw any conclusion in regard to its dependence on life, so long as it is only a vibratory and not a progressive movement,' p. 14.

We have not made much out of the demonstration of conscious life from movement. But we are not going to despair. There are growth, nutrition, and the power of reproduction, yet to be considered. In page 11 he says: 'The growth of the cells is a process of a slower nature, and cannot be directly observed; nor has any one as yet been able to place the cells under the microscope under such favourable conditions as to witness their increase in size.' I confess I was here quite chap-fallen; and I sighed as I glanced at my old jaws in the mirror opposite, to think that I could not stay in the planet another three-score years to help these philosophers in the proof of their theorems. But why despair? This is not half the battle.

We call *nutrition* into the witness-box, upon which the unflinching Stricker remarks in the same page: 'It is difficult to observe the mode of nutrition that occurs in the cells of the compound animal body, because the nutritive materials are brought to them in the form of solution in the juices of the animal body. Moreover, the process by which the dissolved substances penetrate the cells is concealed from our observation.' Learned and sufficient reasons; *because* and *moreover*, both well supported. But alas! there is no evidence, no observation, about nutrition: nothing except our impregnable Must-be-so! and the still more inexpugnable—We know!

So all the eggs are addle but one! Deal gently with that one. O for a loving patient bantam to sit this one! Will Stricker speak again? Unrelenting he goes on about reproduction. He is talking of what he knows, and he will try here at least to talk no nonsense. 'The act of reproduction depends on two separate processes; first, on the growth of the mother cells, and secondly, on the detachment of the daughter-cell (birth). The latter alone is subject to direct observation, and usually this only is understood when reproduction is under consideration:' p. 11. 'In regard to cell formation by fusion, it has been ascertained that the protoplasm becomes partially constricted like an hour-glass, the depth of the constriction continually increasing until at length the protoplasm is divided into two segments. The whole process may be observed under the microscope in the fecundated egg of the frog. No direct observations have been made as to the manner in which in endogenous cell-genesis the daughter cells are set free in the body of the mother-cell:' p. 36.

'It is not really derogatory to us to say that we are still ignorant of the significance of the migrating cells, and that we do not know what becomes of them. Were any one to maintain that the migratory cells are conjugation organisms, no stronger objection could be raised against him than against another who should maintain that the migrating cells are epithelia:' p. 39. No, say I, nor than against another who should maintain that they are organ-grinders or *vivandières.*

Distressed as I was after all this, I remarked—But you have some good reason for affirming that the specks of what you call protoplasm in your microscopes are really living and feeling, and not dead? He replied, 'We must not consider a quiescent protoplasmic mass as necessarily dead,

even if we are unable artificially to excite movement by means of reagents. The protoplasmic substance may possibly be encapsuled when it is not in a state to change its form; and even if it be naked, some unknown cause may hinder its movements:' p. 15. 'It is difficult in many cases to decide whether a cell still lives: it is not sufficient to know that the preparation has been taken from a living animal, or from the body of one which has only been dead for some hours,' p. 45; that is, if the bit in my microscope has been cut out of the cornea or the centrum tendineum of the rabbit that is still living in agony, you have no right to pretend that it is not just as much living and feeling as the rabbit is: no, nor even have you the right to say it, if it be just cut away from the dog which died in torture some hours ago. The next words are, 'If the cells exhibit no amœboid movement, and if, on the other hand, they are not taken from putrefying portions of the body, the determination is difficult, and sometimes impossible.' That is, as the whole context proves—your pretence that the bit cut away is dead, supposing it not actually taken from a putrefying portion of the animal, is groundless assumption, even if it exhibits no movement at all. He goes on: 'In the present state of our knowledge, chemical reagents do not enable us to arrive at any positive decision, unless their action is sufficiently slight to excite movements, but not to effect complete destruction:' meaning evidently that, in cases of their action that we consider only slight, we have a right to be positive, if we choose, that the preparation is not killed, but yet living. This is obscure, either from the constraint under which the writer had to express himself on a subject so unfit for the public ear, or from some defect in translation.

He concludes the chapter thus, p. 47: 'If the cells

have been killed by powerful electric currents, by a high temperature, or by mechanical violence, the determination of their condition, after what has already been said upon the effects of these agents, can no longer be doubtful;' that is, we allow that they are dead. 'But if no remarkable alteration of form (flattening, tearing, bursting), no remarkable physical alteration (clouding, coagulation), and, lastly, no definite change resulting from the action of the fluid in which they have been preserved, furnish indication of the death of the cells, no scientific value can be attributed to any statement made respecting it:' that is, respecting the death of the cells. If no change that I think remarkable enough to be an indication of death has occurred in the preparation (no matter apparently how long I have preserved it), you need not inform me that it is not living and feeling matter; for your opinion has not the slightest scientific value! Did I say too much when I attributed to these vivisecting biologists a daring enthusiasm of superstition, and abundance of cruelty?

These are the prophets, and these the scientific arguments, which have shaken the brave, godly and learned Francis Newman out of his logical equilibrium. I never was more hurt in my inmost soul than by the discovery that a thinker and a mathematician of his power should have permitted himself to pen the following: 'She [Miss Cobbe] seems to forget how limited is our knowledge of the possible and impossible; and that it is by no means *certainly* beyond the sphere of external science to establish that the re-existence of an individual man, whose body has crumbled to dust, is a physical contradiction. Wherein IDENTITY consists, no one seems able to say. We know that our minds and souls were either born with our bodies; or, if with Plato we say they pre-existed, their previous

existence was nothing to us. I cannot shut my eyes to the possibility of its being hereafter accepted as a physical and metaphysical certainty, that a disembodied soul of man is a monstrous idea against nature, intrinsically absurd, and incapable of being identified with a man who has lived in organic flesh. If this were proved to me beyond dispute, should I then conclude (or would my friend draw the inference) therefore God is unjust? Miss Cobbe herself seems nearly convinced that memory has been scientifically proved to depend on "the brain tablet"' (pp. 74, 77). 'What would future existence be to any of us, if it cut away all the memory of the present world? I confess if my confidence that God is just depended on the certainty that man is immortal, while the latter opinion is possibly disprovable by science, I could have no firm faith in the attributes of God at all' (pp. 14, 15).—'On this and the Other World,' by Francis W. Newman (Thos. Scott).

If Professor Newman were to ask me in earnest (I do not think he would ask it), What is Identity?—I should reply, It is an abstract in *-ity*, which it is unbecoming of a man of science to use to me in serious question or answer, until he knows exactly, and can help me to know as well, what he means by it, and wherein he takes it to consist. Surely he is above that old philosophistic blunder of first coining a word in -ity or -ation, and then diving into the abyss for a meaning. It is orthodox and proper to catch your hare before you give directions to cook it; but it is quite improper to catch your long-tailed abstract, and set it up in capitals, before you have a meaning for it. If by re-existence of me-the-thinker, he means the continuance of my thinking with this I am, I will, I can, and I ought, either in this or in another body, I hope that I have said enough to convince my reader that the establishment of the

'physical contradiction' spoken of is by *all* means and with all demonstration *certainly* beyond the sphere of external science.

I am not sure that I see what Professor Newman means by a *physical* as distinct from a *logical* contradiction, nor can I expect in a tract of twenty pages to find all his meaning cleared to me. But I may say that if the contradiction could be deduced, it could hardly be one between terms purely physical, if things physical are mere facts and forces of the sphere of external science. For I deny that my 'I am' is a proposition of physical science in my mouth. It is the one prophysical and superscientific datum from which alone it is possible for me, at any moment or in any place, to make a single step of scientific thought towards the physics or towards the history of myself or any other mind, or of my own or any other body. The train of rigorous thought for me never begins with 'I was' or with 'I shall be,' but only from this present 'I am,' and to this every argument of an opponent about past, present, or future, with a frank 'Thou art,' must consequently address itself in the last appeal; a condition that is equal for both of us.

In Professor Newman's question 'What would future existence be to any of us, if it cut away all the memory of the present world?'—if I may treat it not as a matter of mere momentary sentiment, but as a theme for earnest thought—I would fain ask whether the *us* stands for *us now*, or for the supposed *us of hereafter*. And I would rejoin with the enquiry, Is it nothing to us now, nothing in science, nothing in sentiment, nor in religious thankfulness and wonder, nor in our hope of future knowledge of the past, to know that we lived an antenatal life? I would ask,—Was it any wrong done to me the babe unborn, or

any drawback, in the judgment of one who could then think on me with interest or concern, on my value for that present, or on my prospect for the future, that I was there and then preluding a life in which I should remember nothing of the joy or the distress of that feeble one? Are the mercies dealt to it nothing to me now as a philosopher or as a worshipper?

Mere sentiment apart, the force of Mr. Newman's reply to Miss Cobbe lies in his statement of what 'she seems to forget.' Its weakness to me lies in what he seems to forget —the statement of her blunders in logic.

It is not necessary to say more, after what I have remarked on this topic in my Chapter XII., which is not a whit dismayed by the execution that my opponents seem to have done upon one whom I deemed a more formidable foe to them. If my chapters have any logical defect or value worth regard, either will be usefully illustrated by this quotation from the tract of F. W. Newman; and I am glad to decorate my pages with his name.

APPENDIX V.

Note on Section 163, *page* 277.

It is becoming the fashion to revive the reasons invented by David Hume for condemning all speculation concerning the cause of the universe, the only reasons that I ever saw. It is a piece of good fortune to have the meaning of our matter-and-must-be teachers presented in something like a shape. Before me is a new edition, in a very cheap form, of Hume's 'Dialogues concerning Natural Religion' (Thomas Scott), with notes by an anonymous editor. The pith and marrow of the whole are in

the following words of Philo, the unanswerable sceptic and materialist of the party, p. 44: '*How therefore shall we satisfy ourselves concerning the cause of that Being, whom you suppose the Author of Nature,* or, according to your system of anthropomorphism, the ideal world into which you trace the material? *Have we not the same reason to trace that* ideal world *into another* ideal world, or new *intelligent principle*? But if we stop, and go no farther, why go so far? Why not stop at the material world? How can we satisfy ourselves without going on *in infinitum*? And after all, what satisfaction is there in that infinite progression? Let us remember the story of the Indian philosopher and his elephant. It was never more applicable than to the present subject. If the material world rests upon a similar ideal world, the ideal world must rest upon some other; and so on, without end. *It were better therefore never to look beyond the present material world. By supposing it to contain the principle of its order within itself,* we really assert it to be God; and the sooner we arrive at that Divine Being, the better. *When you go one step beyond the mundane system, you only excite an inquisitive humour, which it is impossible ever to satisfy.*' The italics are mine.

This passage is evidently the grand brilliant of these dialogues. The editor appends to it a hot and rayless commentary of two pages, in which we are informed that 'at a meeting of the British Association for the Advancement of the Sciences at Belfast, August 1874, Professor Tyndall, in his inaugural address, republished this doctrine [*that the material universe contains the principle of its order within itself*]. The circumstances under which it was thus ushered into the world rendered it almost impossible that the clerics could remain silent . . . Their conduct was ridi-

culous in the extreme. . . . They shrieked and screamed, and roared and shouted, and ranted and raved, &c. . . . Not one of the preachers even pretended to consider whether it was possible that the material universe really did contain within itself the principle of its own order. All they attempted was to vilify the doctrine and insult Mr. Tyndall.'

Let us, before it is too late (if that be not done too late which has scores of times been done before), hasten to fill up the shocking gap in the logic of those clerics. Let us consider this luminous theorem, thus ushered anew into the world, that '*the material universe contains within itself the principle of its own order.*'

There are theorems, and there are cries; the former for inscription on the pillars of science, the latter for the decoration of sectarian and party bunting. There are also mongrels called cry-theorems, which form the principal wealth of mock-science. These differ from mere cries in having a support of logic good enough for the criers. With a proposition manufactured from vague abstracts for the purpose of mere negation, which commits its assertor to no definite affirmative besides, Must be so, I know—science can have nothing to do. I have looked in vain through these dialogues for any positive meaning of Hume in this theorem; nor do I believe that he either knew or cared what he positively intended by it. To our editor it is evidently little more than a cry. As I am considering it, I must ask for a meaning, First, I say to its admirers: if you present it to me as a disguise of your grand solvent, must be so, we know!—if you intend to affirm your necessity, with *must-be*, and without *must-follow*, it is far too wise for my study. Whether you write, as a qualification of a conceded *will-be*, your positive *necessarily*, or

your negative *unconditionally*, with no reason why but *must-be*, you posit with either sign the same empty zero of thought. You add nothing, you subtract nothing, you ask nothing, you answer nothing, and you suggest nothing, except your own pretentious and helpless ignorance.

We cannot treat this theorem as an expression of human thought which may be intelligently affirmed or denied, until its vague and vast generality is restricted. To state all that it includes is impossible; but we may endeavour to define a meaning of which all parties shall allow, that the theorem positively affirms so much at least, while granting that it may affirm more. The least compass of meaning for it, that I can offer to the acceptance of those who hold the theorem to be a truth that can be conceived by man, is this. There is contained in the material universe a principle (P) of the order of the universe, such that if a competent intelligence N, human or superhuman, were scientifically master of it, and had in his power all the applications and illustrations of it that he might desire, he (N) would be able to deduce with *must-follow* from P, any well-known definite fact Q in the order and contents of the material universe, in such a way as to satisfy scientific thinkers of his own rank; that is, he would be able to show that the fact Q, in its definite time, place, and number, was a necessary logical consequence flowing out of the principle P, without any appeal to *must-be*, unsupported by *must-follow*.

If any maintainer of the theorem declines to say that he means, at the least, rigorously all that I have above expressed, I venture to inform him that he has no clear notion whatever of his own meaning. He has a cry, but no theorem. Let it be observed that P stands for the affirmed, yet to all of us confessedly unknown principle,

whatever it may be, and that Q stands in perfect generality for *any* known and definite fact, law, or property, capable of being stated in scientific terms that I or any other thinker might select, as a part of the order and contents of the cosmos given to observation and thought. The word *material* is not of my choosing, but I take it to denote in conjunction with *universe*, in the mouths of Hume and his disciples, the whole cosmos of fact and force and life which is given to human observation. No reader capable of studying these subjects is unaware that we can by help of the symbol P, *defined* as the unknown *principle* of this vast theorem, reason to a certain extent as correctly as we could if we were actually masters of that principle. We know as well what we mean by P, as we do what we understand by the principle in our theorem, for which it stands.

I assume that my Humian reader accepts the above expression of the sense of the theorem as rigorously his own: that is, he holds the statement above made about the principle P and the fact Q to be rigorously true. If it is true, it will be impossible by fair logic to deduce from it anything absurd; and if by fair logic anything absurd is deducible from it, such deduction will be a demonstration that the theorem is false, and that there is no such principle P.

We are supposing certain trains of scientific thought. These must consist of propositions. There must be a first proposition. This cannot be—*There is a principle P, the principle of the order of the universe.* That is a truth of Theism which Hume's theorem is intended to overturn. To us Theists the Divine Spirit and Energy is the principle P. But if we add, *which P is contained in the universe,* we have the correct first proposition.

Let P be the principle of the order of the universe, by definition, for Theist and Non-theist alike. Then, *P is contained in the universe* is the proposition with which all the demonstrations of the intelligence N would begin. This is, as it ought to be, a flat contradiction of the theistic beginning; for the theistic P is not contained in the universe.

We must have the fact Q selected: let Q be the known and definite arrangement A, or the beauty B, or the consciousness C, or the danger D, or the experience E, or the force F, or anything that can be scientifically defined as known in the cosmos. If the theorem under consideration be true, N would be able to complete trains of logical thought, every one beginning with—P is contained in the universe, and each in turn ending with *Ergo*, the arrangement A is contained in the universe, or with—*Ergo*, the beauty B is contained in the universe, or with—*Ergo*, the consciousness C is contained in it, and so on, with a different conclusion for every different selection of Q. Now if the theorem is true, it will be impossible to make an absurd conclusion by putting for Q any fact, force, or property whatever, definable as known to be in the cosmos, and asking N to deduce it logically from the principle P. Allow me to select for the Q what I learn from the theorem itself to be contained in the universe. I select the principle P. This is part both of the contents and order of this universe of Hume's; it is in truth the one fact which makes the specific difference of the order of his universe; for it is the only thing in which the materialist differs from the theistic universe, the latter being one which does not contain within itself the principle of its own order. If the theorem be true, N is able to deduce this P by his logic.

Observe what we have done: we have deduced by fair logic, from the grand theorem of Hume, the absurdity, that there is a train of scientific thought possible, which shall begin with—P is contained in the universe—and which shall end with—*Ergo*, P is contained in the universe—a vicious circle. That is, we have deduced from the theorem a flat contradiction, which is a complete demonstration of its falsehood.

I shall not dwell upon the comments that would-be logicians will easily make here: You have no right—we did not mean that—that's another thing, &c. They must either take that, or take this, exactly this, for their theorem. There is contained in the material universe a principle P of the order of the universe, by which everything in the universe except P can be logically accounted for. If for *contained* you write *transcending* or *uncontained*, this is exactly the theistic position on which Philo in the extract first given comes down in that victorious onset. Every withering word of that onset is hurled on the head of David Hume; and the end of him is that he is strangled in the twist of his own sophistry:

> nec est lex justior ulla
> Quam necis artifices arte perire suâ.

Professor Tyndall, who knows far more on this subject than either Hume or this dangerous editor, will probably point out to us that every cloud and perplexity will disappear, if we permit him to put his big M for our troublesome P.

We may now leave the grand theorem republished by Dr. Tyndall, and make a little inspection of the profundity of Hume's Philo. The words italicised in the speech of Philo on page 334 specially invite the reader's attention.

By the query, 'Have we not the same reason to trace, &c.,' he means to affirm the equivalence of two reasons: one the reason, good or bad, which led us to enquire into the cause of Nature; the other the reason before us for enquiring into the cause of that cause. The *idcal world* of Philo is a confusion in which Hume, I dare say, saw some convenience. It stands for the divine perfections which the Theist assigns as the cause of the universe given to his experience and observation. These two reasons are alike, says Philo; in fact, 'the same reason.' Any amount of quibbling may be expected, from students so acute as this editor, about the difference between *have we not?* and *we have.* But the reader sees that, since I cannot fight with a *Will-o'-the-wisp*, I must take it that there is an affirmation before me. On this assertion of the sameness of the two reasons, and on nothing else, depends all the sense and force of Philo's argument.

To the question, why did Hume prefer the query, Have we not? to the plain We have, it is hard to give any answer, but that which accounts for much of the rubbish that he concocted, namely, that he often amused himself at the expense of the quacks and bigots of his day by constructing dunce-traps and vicious circles.

I have to reply to this affirmation of the sameness of the two reasons for tracing out the cause. I say that this affirmation, uttered in earnest from the mouth of a David Hume, is a deliberate and wilful falsehood. I do not believe it to have been uttered in earnest. Coming out of a head like our editor's, the affirmation may be innocent enough.

For what is my reason for enquiring about the cause of this cosmos given to me? Simply that it is given to me; given to me in detail, harmony, and constancy, pro-

portioned to my faculties of sensation and thought, over all the finite within my reach. I can ask, and I can sometimes succeed in answering, scientific questions about this universe. This encourages me to speculate concerning its cause.

But have I a like reason for enquiring into the cause of the Cause and Principle which I infer and adore? That 'ideal world' of divine attributes, counsels, and energies is not given to my faculties of sensation and thought. If they could be placed within my ken and grasp, I might have a reason for enquiring into their cause and principle. As it is, I have none: and the affirmation of the sameness of the two reasons is the most stupid of falsehoods. Thus the windbag of Philo collapses, and we simply laugh at one of David Hume's dunce-traps, which, if not ingenious, appears to have been marvellously successful.

The close of Philo's oration establishes the wisdom of abstaining from all thought about the cause. It is hugely admired; and the sages find the comfort of their discovery that it is 'better never to look beyond the present material world.'

We are bound to hope the best about each other. I am willing to believe that there are civilised men without affectation or sinister aims, whose lazy determination not to think at all is pleased to wear such a pompous look of thinking.

There can be no doubt that this pitiful sophistry of Hume has frequently been exposed; but our lively Matter-and-must-be-ites will still go about with impunity in this practical money-making England, and sing out to crowds of believers—What a shame it is that Hume has not been answered!

We see that the fine old theorem which had the glory

of being re-promulgated by Professor Tyndall at Belfast, August 1874, amounts, like nine-tenths of all that our fashionable teachers of science have to hint or to say against the truth of Theism, and against the foundations 'I am,' 'I ought,' 'I can,' and 'I will,' to nothing more than a vicious circle.

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